The Builder.

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Glasgow International Exhibition.

WHATEVER may be urged against the frequency of great international expositions, the success of Glasgow's former venture of 1888 seems sufficient warrant for her Exhibition of this year. The circumstances are very similar to those obtaining then, and the fact that the centre-piece in the present display is an Art Gallery, whose origin was the handsome surplus yielded by the former Exhibition, is an encouragement, almost an assurance, of something more than a summer gaiety and the temporary fillip to local trade being the record of this second effort.

The site is the previous one in Kelvingrove Park, but more ground has been enclosed. Across Dumbarton-road, which forms its boundary, is placed the machinery hall, reached by a bridge; and this, with the industrial hall and the concert hall, all apart, and one or two large restaurants, constitute the temporary buildings of the Exhibition. The art gallery, designed by Messrs. Simpson & Allen, occupies a central position and is connected by covered passage with the grand avenue, but otherwise it is untouched by any temporary decoration. It is an ornate structure in red sandstone, but no attempt has been made in the surrounding erections to echo any of its features; they rather serve as a foil, in their colours and lightness of character, to emphasise its permanence.

It is with the Exhibition buildings proper that we are mainly dealing here. Though these are unavoidably disconnected, it must be said that something more might have been done by way of symmetrical allignment, not only with the gallery, but with the approaches, the river, and its bridges. The axes of walks and buildings seldom agree, and this is only too obvious from the park heights which afford a panorama of the whole grounds. The general aspect of the buildings is one of brightness and gaiety. Excepting the domes and roofs, gilt-tiled or painted, all is of plaster left white. This system (following the lead of recent exhibitions) has much to commend it in preference to painted wood boarding. The present is by far the largest use made in this country of this material, and it is not unlikely that this may lead to its employment, with some modification, for more permanent and yet light structures. It is applied to the framing of the buildings in large plates, for ease in handling kept to about 5 ft. by 3 ft. 6 in., though this size is often increased. The plates are formed by slight stretchers of wood, with additional strips as required, laid on a metal table; plaster is then poured on and a sheet of thin sacking embedded; more plaster is added and a return ply of the canvas pressed in if required for stronger work, and in a few minutes the plate can be nailed into position, and bear very considerable vibration without fracture. The joints require, of course, to be filled up with plaster, and at the same time a thin finishing coat is applied over the whole surface, which is finally painted. How far paint will form a protection from frost and weather to ordinary stucco this present experiment can only help to show. The upper surfaces of the cornices, it should be said, are of felt. This use of plaster lends itself admirably to modelled work, not fashioned *in situ* but done in pieces just as the other, and this quality has been fully taken advantage of. Throughout the spirited ornament and specially the modelled figures of Mr. Albert Hodge will be noted and admired.

The architectural style chosen is Renaissance of a Spanish type; only here and there is seen a slight breaking away from historical precedent, in one case taking the form of Italian Gothic, and elsewhere that of the very latest German "arts and crafts" decoration. Of course, it may be urged that an extraordinary requirement should have been met by a treatment other than that associated with enduring structures; but the illogicality of columns and cornices in hollow plaster simulating stone is not much greater than that of the stereotyped features of the entablature derived from a wooden prototype, and allowance must be made for a popular delight—not necessarily vulgar—in a scenic display of architectural forms beautiful in themselves, and suggestive to many of more than meets the eye.

Mr. Miller's effort is the group of dome and tower, forming the centre-piece of the industrial hall. The dome shows a little more than the half-sphere, rising from a square plateau, at the corners of which are towers, but so far from the dome as to require low cupolas to fill up the diagona space, the resulting group is therefore of considerable intricacy and richness.

The dome is of sufficient exterior bulk, and, as it has no inner shell, just high enough for interior effect. The cupolas, and the open belvedere between the towers form a tea room, reached by elevators, thus usefully taking advantage of a fine position for outlook. One may regret that so much elaboration has been concentrated on this part of the erection, to be demolished after six months' use with the rest, but the first intention was that the dome should be retained as a winter palace when the surrounding buildings were cleared away. This idea, however, has been abandoned, and properly so, for so large an erection would encumbe the park, and its near proximity to the Art Gallery would be a disadvantage to both.

In front of the dome, towards the river, is a piazza—a costly feature in respect of the let-able floor space sacrificed to it, but one which amply justifies itself as a dignified architectural adjunct. Its side to the river is an open colonnade, with a great archway: all constructed decoration, but more than defensible. As effective as any part of the whole design is the wall-face extending between the eight pavilions that mark the corners of the two squares into which the industrial hall is divided by the dome and piazza. It is in stretches of a dozen bays or so of arched windows between pilasters; beneath is a perfectly plain story; above, a

cornice and pierced parapet, all very well illustrating the value of repetition of parts. The pavilions have red-tiled roofs, greatly projecting eaves, and semi-spherical domes, felt-covered, and painted green like copper. The great dome is entirely gilt. It is in these pavilions that the anachronisms in style referred to appear, the great coved cornice resting on nondescript pilasters, which are altogether out of scale, being much too large. The arched cove has an outward bulge, and this feature is repeated with exaggeration at the great entrance from the piazza.

There is much variety of design in the many towers. Those at the ends of the Great Avenue are square, rising to an open belvedere, with a circular centre tower rising higher. Slight vagaries in style here are the vaulted covering above and the heads themselves of the window lights, which are of ogee shape with Gothic-esque labels. Other smaller towers are circular, some tapered; all have covered roofs; all have far projecting shelf-like eaves that with their white undersides light up very well.

The machinery hall has only one frontage, that to Dumbarton-road, consisting of a central gable and two lesser ones on either side. Twin towers flank the centre, where the covered way bridges the road and connects by the Grand Avenue with the rest of the Exhibition.

The concert hall is a rotunda, and accommodates over 4,000 persons. A balcony extends the depth of a circular aisle, and the roof is a saucer-dome (externally felt, painted green) with an eye for light. There is no break in the circle for an organ recess, the face of the instrument lining with the columns that form the aisle. There is a square annexe for the entrance, with a central and two side staircase towers. Here occur some Italian Gothic tracery and Venetian trefoiled battlements; but the imported features are quite in scale. At the opposite diameter is a large restaurant, in its great extent an afterthought of the Executive, which quite inexcusably involved the demolition of an interesting old mansion, Kelvingrove House, against the protests of the Glasgow Architectural and Archæological Societies and all citizens of taste. This restaurant will be removed with the Exhibition, but it is intended to preserve for a time the concert hall; its metal construction will permit of this, but it remains to be seen how its fragile wallings will stand.

Regarding the materials of construction, a change was made during the progress of the works, wood largely taking the place of metal because of difficulty in getting delivery of the latter. Only the centre aisle roofs of the industrial and machinery halls, the dome, and the concert hall are of metal. The roof principals are made up of light L irons in various combinations, and take the form of elliptical arches; in the larger instance the foot is contracted to a pivot at the foundation to permit of contraction and expansion. The other roofs are of ordinary wood trusses. The extent of glass is about three-fifths of floor area. The floor itself is close-boarded, less cold and more cleanly than open plank

ing. Laminated wood construction is only employed at the Grand Avenue, where semi-circular principals in four thickness of 1-in. "stuff" give an architectural effect more pleasing than the truss roofs.

It has been an aim to give as uninterrupted a floor space as possible, and this practical end has been attained. The fewness of roof supports is quite remarkable; but the spectacular result is most disappointing, for the actual extent cannot be grasped in the jumble of exhibits, of all shapes and sizes, through lack of division into courts. What is required is that the roof supports should be emphasised, whether as colonnade or arcade, anything to give scale and vista—a row of useless "Venetian" masts would do this—and so give the advantage to exhibits of frames to pictures of a size the eye can grasp.

This very openness of the industrial hall accentuates the solidity of the towers surrounding the dome, and the four arches between, of deep soffit. Attached to the pendentives are great modelled winged figures standing in the prows of galleys. Up to the first cornice all is plain white, above in the drum a conventional landscape is painted, interrupted by the windows that light the tearoom. Above is the range of lucarnes, and over all the unbroken hemisphere with floating figures painted on it. Under the dome is a statue of his Majesty, modelled by Mr. Hodge. This part, then, alone of the interior is treated architecturally; all around is a riot of heterogeneous exhibits. It will be gathered that the principal artistic merit of the buildings is external, and the architect, Mr. James Miller, is to be congratulated on his conception, satisfying as a composition and made interesting by clever detail.

NOTES.

The Monument to Queen Victoria. IT is understood (though not officially announced) that five architects have been selected to submit designs for a structure to be erected in front of Buckingham Palace as a monument to the late Queen, viz., Mr. T. G. Jackson, Mr. Aston Webb, Mr. Ernest George, Sir Thomas Drew, and Dr. Rowand Anderson. We have no fault, of course, to find with the selection of names as far as it goes; but it is rather a limited one, and we do think that in the first instance there should be a sketch competition open to all English architects and sculptors—for the architects ought to work in conjunction with the sculptors for such a monument, as would certainly be the case in France; and we repeat that if such a structure as is apparently contemplated be set up in front of Buckingham Palace, it will make the Palace front look ridiculous. The Palace façade and the whole laying out of the adjoining site ought to be integral elements of the design; and it will be a failure if they are not made so.

The Use of Water-Gas in London. THE substitution of carburetted water-gas for coal-gas in the public gas supply in certain parts of the Metropolis is proceeding apace. The report of the Commercial Gas Company shows that during the last half-year 83,945 tons of coal were carbonised, and 1,758,190 gallons of oil were also used for gas manufacture, the total make of gas being 1,406,501,000 cubic feet. Apparently, therefore, about 40 per cent. of the total output of gas consisted of carburetted water-gas. It is evident that the recommendations of the Departmental Committee which sat in 1899 to inquire into the use of water-gas are being quietly ignored, and the nature of the gas supplied is being changed without any reference to the wishes of the consumers. We do not say that carburetted water-gas should not be supplied if it can be more cheaply manufactured; but we do say that, in view of its greater gravity and the large proportion of poisonous carbonic oxide it contains, consumers should be warned to examine the soundness of their gas-fittings, and the statutory minimum limit of gas pressure should be raised. It is not in London only that water-gas is replacing coal-gas. The recent increases in the price of coal have caused it to be introduced in most of the large towns throughout the United Kingdom.

The Sanitary Condition of Factories. WE have said many times that, however desirable improvements in sanitary legislation may be, the first need is that Sanitary Authorities should carry out the law. If they would do this further legislation would be little required. No stronger instance of the obstructive tendency of the existing authorities can be found than the recent case of Tracey *v.* Pretty & Sons, which can be found in the March number of the "Law Reports." Messrs. Pretty were the owners of a corset factory at Ipswich, and the factory inspector gave notice to the Sanitary Authorities that there was a deficiency of sanitary accommodation at this factory. The authority, however, took no proceedings as they should have done, and the inspector thereupon gave notice to Messrs. Pretty, under the Factory and Workshop Acts, that they must provide proper sanitary accommodation. Again nothing was done, the owners of the factory taking no steps to remedy the defects, and thereupon proceedings were taken before the justices to recover the legal penalties for this neglect. At the hearing of the case these gentlemen decided that they could go into the merits of the case, with the result that they found the accommodation sufficient and dismissed the summons, with costs. Upon the question of fact it is sufficient to quote from the judgment of Mr. Justice Grantham:—"If it was necessary to show the reasonableness of the requirements of the inspector, and the ignorance of magistrates of the usual accommodation provided in factories, I might add that whereas one water-closet for every seventy persons was considered by the magistrates sufficient in this case, yet in London and all the principal towns in England one in twenty to one in thirty is the minimum number provided." No words could be more condemnatory of the action of the Local Authority and of the local magistrate than this judgment. When the case came before the Queen's Bench Division it was held that the justices had no jurisdiction to enter into the merits of the question, and that their decision must be quashed. This judgment, therefore, greatly strengthens the hands of factory inspectors in regard to sanitary matters, but it also shows that for the improvement of the sanitary condition of many places in England pressure upon the Local Authorities is absolutely necessary.

The Temperature of Workshops. THE value of the supervision of the Central Government is well exemplified by a case which was recently decided in one of the London Police-courts. The owner of a workroom which was used by a number of girls was summoned for not keeping it at a proper temperature as required by the Factory and Workshops Act. It was proved that the temperature was less than 60 deg., and this, upon the evidence, the magistrate held to be a non-compliance with the Act of Parliament. Sixty degrees, he said, was the lowest temperature at which a room occupied by workers sitting still should be kept. The owner was accordingly convicted. Warmth is as necessary as food or drink, and such a decision as this marks the onward movement in regard to sanitary regulations. Yet one cannot but smile at the conviction of this person, for what hundreds of people in England engaged in sedentary occupations are obliged for a long time to endure a temperature less than 60 deg.! There are numbers of comparatively comfortable houses which in this country are never kept, and cannot be, at a temperature which is seasonable. In spite of our mild climate, there is probably greater discomfort suffered from cold than in any country in the world. Private persons must be allowed to do what they will with their own, but railway companies and other corporations which do business with the public should be compelled by statute to keep the interior of their buildings at a proper temperature.

Manchester Fire Station Competition. THIS competition was advertised in our columns last week; it will have been noticed that nothing was said as to an assessor being employed, a point which could not be discovered without depositing two guineas for a copy of the Conditions. No architect in his senses (none of any standing at least) would go into such a competition unless an assessor were appointed; and it is, of course, exceedingly unfair that people should be expected to risk two guineas to discover whether an assessor has been appointed or not. A correspondent who has risked his two guineas, however, writes to us to say that the Conditions include the following: (1) the Corporation do not undertake to place the work in the hands of the architect to whom the first premium is awarded; (2) the remuneration, if they do employ him, is to be at the rate of 3 per cent. instead of the usual commission. The Corporation of Manchester must be very badly advised if they suppose that any architect of standing will go into a competition on such terms. Our correspondent adds—"I have just stopped payment at the bank of the deposit cheque of two guineas"; and probably those architects who may read this will keep their two guineas in their pockets.

St. Mary's Hall, Coventry. A CORRESPONDENT, writing from Coventry, sends us an alarming advertisement from the *Coventry Times*, signed by the City Engineer, inviting tenders for work to be done on the old and interesting fourteenth-century building called St. Mary's Hall, which, the advertisement states is to be "restored and renovated." As far as we gather from the advertisement, the City Engineer has the work in hand. Surely in

such a case the Coventry authorities ought to call in the assistance of an architect acquainted with Gothic architecture, and not leave the treatment of the building to an engineer.

The Poultry Cross, Salisbury.

THIS well-known monument, a conspicuous object in the quiet streets of Salisbury, seems to be threatened with the same kind of treatment as St. Mary's Hall at Coventry, mentioned above: It is to be repaired, under the direction of the City Engineer, at the hands of a local firm of "monumental masons and sculptors," who execute "all kinds of memorials in granite, marble, or stone." It is moreover to be treated with "fluate" to prevent its further decay; an operation which must be preceded by the removal of all lichens, &c.; in short, the older portions must be scoured to a raw new surface. It is gratifying to find that a protest was raised by a member of the Town Council (Mr. Pye-Smith) against any attempt at a wholesale restoration, or anything beyond making good the decayed portions; and an amendment to this effect was carried, but only by the Mayor's casting vote. The Cross, it is true, was so much restored fifty years ago that much of its archæological value is gone; but it still retains some of the ancient work, and such a monument ought not to be left to be dealt with by an engineer and a firm of masons. The Council have at their very doors a most competent archæological architect, Mr. Doran Webb, of Salisbury; why do they not consult him?

St. Paul's Church, Ball's Pond.

THE Ecclesiastical Commissioners have agreed, it is stated, to contribute 500*l.*, and an appeal is made for further subscriptions, towards the proposed reparation and improvement of this church. The sum required is estimated at 2,500*l.* The alterations include the restoration of the outer stone and brick work, an enlargement of the choir vestry, the decoration of the interior, repairs of the organ (by Russell, 1828, improved by Willis, and enlarged by Robson, 1875), a new choir, &c. The district Church of St. Paul, standing at the junction of Essex and St. Paul's roads, was built in 1826-8 after Sir Charles Barry's plans and designs, in pursuance of what is known as the "Million" Act of 1818, 58 Geo. III., cap. 45. Under a subsequent Act of 2 Will. IV., cap. 26, it was decreed that a sum of 1,000*l.* a year, derived from the endowment, which is now greatly increased in value, of Richard Cloudesley's "Stoney Field" or "Fourteen Acres" trust (1517) in Islington, should be shared equally by the three district churches of St. Paul, St. John, Holloway, and Holy Trinity, Cloudesley-square, and the Islington Chapel-of-Ease in Holloway-road. In our article of January 5 last upon Sir Charles Barry's works we commented upon the architectural features of St. Paul's Church, which was erected during the rectorship of the Rev. D. Wilson.

Portman Market.

IT is stated that the new market, erected at a cost of about 40,000*l.*, will be formally opened on Thursday, 18th instant. Plans and designs for the new buildings were prepared by Messrs. Gordon, Lowther, & Gunton for the Portman Market, Limited, a company that was constituted for taking a lease of the property from Lord Portman; the purchase price of the lease and existing market rights were fixed by the vendor at 40,000*l.* The site, being that of the original market, is in Church-street, St. Marylebone parish, and covers an area of 43,500 ft. superficial, opposite the goods terminus of the Great Central Railway, with entrances from Salisbury, Carlisle, and Church streets. The market was established there under the provisions of an Act 11 Geo. IV., cap. 71, and additional powers were obtained in terms of an amending Act of 2 and 3 William IV., cap. 113.

Sketches and Studies by Millais

THE announcement of an exhibition of pictures, drawings, and studies by Millais, at the Society of Fine Arts Gallery, does not seem to have excited the interest that one might have expected, for the attendance at the private view last Saturday was smaller than usual on these occasions. It may be admitted also that the collection was to some extent disappointing, as the majority of the sketches for well-known pictures were of an exceedingly slight description, and could hardly be called "studies." Mr. J. G. Millais, in his short preface to the catalogue, remarks indeed on the fact that Millais, except during his "pre-Raphaelite" period, did not think it necessary to make highly-finished designs for his principal figures; "as a rule he was content, before making a big picture, to cover odd sheets of paper with scores of outlines for it." Many of these are here—the slightest possible experiments in the grouping and pose of the figures; and certainly the finished pictures convey no idea of want of preliminary study, and it is interesting to be thus let into the great artist's method of work. Among the few careful studies are those for the separate figures in "Wounded in the House of my Friends," which are of great force and intensity—Millais evidently put his whole heart into this picture; and there is a small highly-finished drawing for the "Ophelia." The drawings made when the artist was still a child—"Turks Robbing a Chest," drawn at the age of nine, and the study of a man's head and two feet, when he was under eight, are remarkable examples of precocious talent; the foreshortened feet are like the work of a practised artist. Very remarkable, too, is the large water-colour of a scene from "Peveril," crowded with figures and very well composed. The sketch for the "Boyhood of Raleigh" shows that the broad-brimmed hat of the sailor, in the finished picture, was an afterthought; in the sketch he is bareheaded; it was a most happy alteration, by which the effect of the picture gains immensely. The sheet of designs made in 1852 for Ruskin, to show "how natural forms may be made to conform to architecture," is curious, and the border is a noteworthy piece of illumination design, but one cannot wish that the other suggestions (animals worked into the lines of window-tracery, &c.) had ever been carried into execution. Among the complete drawings is the exquisite and delicate little pencil-and-tint work called "Reverie," a perfect little picture in itself. The oil-paintings lent are "Sir Isumbras," which one is always glad to see again; the early picture of "Cymon and Iphigenia," which might have been painted by Etty; and "The Woodman's Daughter," a remarkable work of the early period, which has not been often exhibited: the figure of the little girl is quite in Millais' best way. Among the few finished drawings are the very fine and powerful conception, "Virtue and Vice," and the pen-drawing entitled "The Race Meeting," showing a keen power of satire such as one would hardly expect from the evidence of Millais' finished pictures only. He might, had he chosen that path, have been the modern Hogarth; but on the whole we may be glad that he did not.

LETTER FROM PARIS.

THE "Commission des Grands Travaux Departementaux" decided last week to ask Parliament to vote a credit of 7,200,000*l.* for the purposes of various important works to be done shortly in the Seine department, a portion of which will be 350,000*l.* for the work of purifying the river Seine from the Marne to the Biévre; 240,000*l.* for the construction of old age hospitals; 800,000*l.* for new buildings for schools and colleges; 28,000*l.* for restoring and rearranging the Palais de Justice; 120,000*l.* for a school of arts and trades; 100,000*l.* for the completion of an asylum at Maison-Blanche; 300,000*l.* for the construction of a new asylum for idiots; 180,000*l.* for the transfer of the St. Lazare Prison near Paris; 600,000*l.* for various works of architecture; 1,200,000*l.* for new bridges and roads; 360,000*l.* for the construction of a seventh departmental asylum; and various other works. The credits will probably be voted in July next, and such important works will be a boon to the vast army of the unemployed at Paris since the Exhibition.

The "Jury des Habitations à Bon Marché" has now made the awards in connexion with the competition amongst architects, householders and others for sanitary and economical dwelling-houses constructed since January, 1896, at Paris and in the Seine department. The prize of 80*l.* for the best example of collective dwellings was carried off by the "Société Civile du Groupe des Maisons Ouvrières" for a dwelling in the Rue Jeanne d'Arc at Paris, and a gold medal was awarded by the Municipal Council to the architect, M. G. Guyon. Prizes of 40*l.* each were awarded to the owners of various collective dwellings at Paris, and silver medals to the respective architects, MM. Torlet, Dupuy, Goujon, Hennequin, Duquesne, Chabrol, Contrat, and M. Guyon, the architect of the premiated building above-mentioned. In the section of small family dwellings, medals were awarded to the architects, MM. Contelet, Senet, and Meriot. M. Charles Lucas, architect and member of the jury, one of the chief organisers of the competition, read a most interesting report, and announced that a second competition would take place in 1904, under the auspices of the departmental committee, for collective dwellings, hotels and furnished houses, and small family dwellings. The departmental committee of the Bouches du Rhone has decided to open a competition at Marseilles for a type of cheap dwellings.

The jury appointed to decide the competition for the best and most artistic façades of houses recently erected at Paris, mentioned in the last letter, should have made its award last week; but has decided to make one more visit to the various competing buildings before doing so.

M. Albert Maignan, painter, and M. Guilbert, architect, gave a private view a few days ago at the uncovering of the magnificent fresco which M. Maignan has just completed in the dome of the Chapel of the Rue Goujon, raised in memory of the victims of the Bazar de la Charité. The chapel, which was inaugurated in its incomplete state last year, will be opened towards the end of this month in a finished state.

The jury of the section of painting of the Société des Artistes Français has accepted 1,590 out of 6,000 works of painting sent in, not including the paintings "hors concours," of which there are about 600. The Société des Beaux Arts on its side has accepted only 225 paintings out of 3,000 sent in. The votes of the jury of architecture will take place on April 9.

The Empress Eugénie has sent 400*l.* towards the restoration of the old church of Reuil, where are interred the remains of Empress Josephine and Queen Hortense. The foundation-stone of this building, erected in 1584, was laid by the titular King of Portugal; the splendid entrance-porch is due to the munifi-

cence of Cardinal Richelieu, and was the work of Le Mercier, architect of the entrance-door of the Sorbonne.

M. Henri Jouin, secretary of the Ecole des Beaux Arts, has made a careful inventory of the historical statues and monuments raised by subscription in the cemeteries of Paris, with a view of obtaining the immediate restoration of those which have much suffered through carelessness and neglect. M. Grébauval, Municipal Councillor, has obtained a vote of money for the proper restoration of the most artistic and best known of these sepulchral monuments.

The "Société des Amis des Monuments Parisiens" are holding a meeting to discuss the following questions:—The exterior aspect of the new stations of the Metropolitan Railway — these stations, designed in modern style, are exciting much adverse criticism; the preservation of the balustrading around the Tuileries; the restoration of the railings around the Cathedral of Notre Dame; and the delay made by the authorities in re-establishing the state of the Esplanade des Invalides and the other ground occupied by the recent Exhibition.

The rather sudden demise of the well-known painter, M. Jean Charles Cazin, is announced. Born in 1841 at Samer, he devoted himself to art at an early age; he first exhibited at the Salon of 1865, and for the next ten years gave himself almost entirely up to the teaching of drawing. He was professor of drawing at the Ecole Libre d'Architecture at Paris, then became director of the Ecole des Beaux Arts at Tours, passing later on to South Kensington, where he was professor of drawing. Returning to Paris in 1875, he began to exhibit more frequently at the Salons, attracting great attention by his very personal talent. His best known works are the "Flight into Egypt," the "Journey of Tobias," "Hagar and Ishmael" (which won him a first medal at the Salon of 1881), "Judith," and a number of landscapes, mostly on a small scale, but remarkable for breadth of style. He was, at his death, vice-president of the Société Nationale des Beaux Arts. He was entrusted with the completion of the mural paintings of the Panthéon, commenced by M. Puvis de Chavannes.

The arrangement of the five large rooms at the Louvre Museum destined to receive the sumptuous collection of the Garde Meuble, and form a museum of furniture from the style of Louis XV. to that of the Empire, is nearly completed, and in a few days the removing and installation of the furniture will take place. The walls of these rooms have been decorated in a manner to bring into value their magnificent ceilings. Several splendid examples of Gobelin, Beauvais, and Aubusson tapestry, as well as some magnificent Sèvres vases are already in place.

The question of constructing a new hall for the meetings of Parliament at the Palais Bourbon has been again brought forward. In 1898 a sum of 120,000*l.* was voted for this work; and the official architect of the Chambre des Deputés was asked to prepare a scheme for a new hall to be constructed in as perfect a manner as possible as regards heating, lighting, and ventilation. The architect seems to have left the matter in abeyance, for it is now proposed to obtain competition schemes from various architects.

The various proposals for the utilisation of the Cirque des Champs Elysées not having proved acceptable, the Municipal Council has fixed an annual rent of 2,000*l.* for the building, and will choose the most advantageous offer that may be made; in the absence of any such offer the building will be at once demolished.

The scheme for transforming the Champ de Mars presented by M. Bouvard, architect to the City of Paris, will probably be decided upon and accepted before the end of the present session. M. Bouvard proposes to disengage the façade of the Ecole Militaire by demolishing the Galerie des Machines, and to form a large garden or park leading from the Ecole Militaire as far as the Seine and the gardens of the Trocadero, lined on either side by fine private and flat dwelling-houses. All these houses will be built from one design, the ground floor of each opening on to a covered gallery or arcade with sculptured columns surrounding the whole of the Champ de Mars, and accessible to visitors to the gardens. The gardens will be "à la Française," and will contain a lake 900 ft. long by 330 ft. wide, which will be opened to skaters in the winter time; an elliptical course around the lake will be reserved for cyclists and automobiles, and the whole will include alleys for riders, a theatre and restaurants. This scheme, if put into execution, will greatly improve the quarter and form an agreeable separation between the somewhat rough and dirty quarter of Grenelle and the better quarter of the 7th arrondissement.

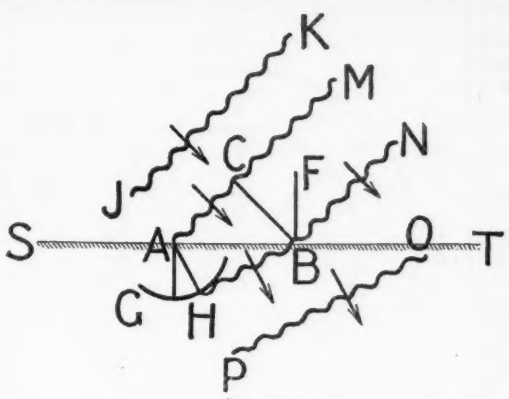


Fig. 1.

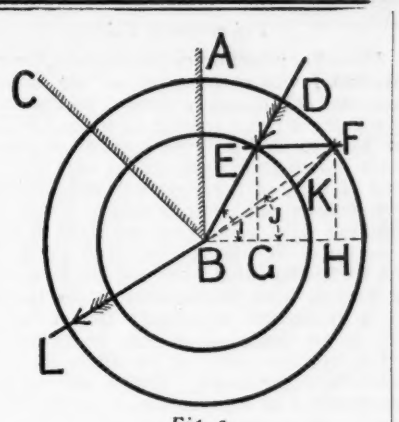


Fig. 2.

LUXFER PRISMS, AND PRISMATIC LIGHTING THEORY AND APPLICATION.*

LUXFER PRISMS as they now exist are the result of an exhaustive study of the refraction and reflection of light, and in opening the subject for your consideration, I wish to review some of the elementary laws of these phenomena.

Refraction.

The velocity of light is about 186,000 miles per second as it passes through space on its way from the sun to the earth, that is, through the ether or a vacuum. If it passes through any other medium, such as air or glass, its velocity differs from the above value. The ratio of the velocity of light in vacuo to its velocity while passing through a particular substance is termed the index of refraction for that substance. When light is refracted it is decomposed, due to the fact that the velocities of the various colours in the given substance are not uniform, so that one colour suffers a greater or less change of direction. The violet rays travel slower than the red, so that the index of refraction is greater for the violet than for the red. In determining the index of refraction for any body the yellow rays are usually taken. The index of refraction for the glass of which Luxfer Prisms are made is about 1·53, which indicates that the velocity of the yellow rays in this glass is about two-thirds of their velocity in vacuo, or about 120,000 miles per second. The index of refraction for air is 1·0003, which for our purpose we may regard as unity.

It is a matter of every-day experience that the direction of a ray of light through media of uniform density is a straight line. It is in recognition of this fact that the savage has learned to aim his arrow and the modern marksman his long-distance rifle. This truth was realised long before the nature of light was suspected. Modern science has shown light to consist of a series of waves which are perpendicular to the direction of propagation, or to the ray itself; and, if we could see the waves, their cross-section would probably remind us very much of the waves coming in on the sea shore. What is emphasised here is that the wave fronts are perpendicular to the direction in which they travel.

When light passes from one medium to another we have seen above that its velocity is changed. Its direction is also changed. We shall now see that the change of direction of the ray is a result of the change of velocity.

In Fig. 1, let J-K and A-M represent waves of light moving in the direction indicated by the arrows, and falling upon the surface of glass S-T. In a short time after the wave has taken the position A-M, the part of the wave which was at C will have passed through the distance C-B with the velocity of light in air. During the same time the part of the wave which was at A will have passed through a distance about two-thirds as long as C-B. If we strike an arc G-H from A as centre, with a radius two-thirds of the distance C-B, we are quite sure that the part of the wave formerly at A will be found somewhere upon this arc. The wave fronts J-K and A-M are practically straight lines, and we know by experience that the wave fronts, after passing through a plane surface, are still straight lines. If we draw through B a tangent to the arc G-H, this line B-H will fulfil all the conditions above for the wave front at the second instant of time considered, and by a more elaborate discussion may be shown to be the actual position of the wave front.

It will be noticed that the direction of the wave has changed. If V_1 is the velocity of light in air and V_2 is the velocity of light in glass,

$$\frac{V_1}{V_2}\ \frac{CB}{AH}=\frac{AB \sin CAB}{AB \sin ABH}=\frac{\sin CBF}{\sin HAG}=\frac{\sin i}{\sin r}$$

where i is the angle of incidence CBF of the ray striking the glass, and r is the angle of refraction HAG of the ray after entering the glass.

Above we defined the index of refraction as the ratio of the two velocities $\frac{V_1}{V_2}$. We now find that this index of refraction is equal to the ratio of the sines of incidence and refraction. This definition is the one which is used in all mathematical work in light, and in what follows we shall use for our law of refraction,

$$n=\frac{\sin i}{\sin r}$$

The Paths of Rays through Prisms.

Let ABC (Fig. 2) represent a section through a refracting prism, and let the light fall upon the prism in the direction DB. We wish to find the direction which the light takes in the prism. Construct at B, as centre, two circles, the ratio of whose radii is equal to the index of refraction. The path of the incident ray strikes the inner circle at E. Project E perpendicular to AB, striking the larger circle at F. FB is the direction of the ray in the prism. For,

$$\sin i=\frac{EG}{EB}$$

$$\sin j=\frac{FH}{FB}$$

$$EG=FH$$

$$n=\frac{FB}{EB}=\frac{\sin i}{\sin j}$$

i is the angle of incidence, therefore i is the angle of refraction.

To find the direction in which the light leaves the prism, project F perpendicular to the face CB, striking the smaller circle at the point K. KB is the direction in which the light leaves the prism. The reasoning is similar to the above.

Let us find the prism angle required to change light from one given direction to another given direction. In Fig. 3, AB represents the surface of the prism. The light falls upon this surface in the direction DB, and we wish to throw this light in the direction B J. Project E perpendicular to AB, striking the outer circle at F. Produce JB, striking the smaller circle at G. Draw BH perpendicular to FG. ABH is the prism angle required.

Fig. 4 shows the path of the ray DE through the reflecting prism ABC. FB is drawn parallel to DE. F is projected perpendicular to AB. G is projected perpendicular to the reflecting surface BC. H is projected perpendicular to the refracting surface AC. JB is the direction of the ray on leaving the prism.

*a

* A paper read before the Northern Architectural Association, February 6, by Mr. R. A. Wood, B.S., M.E.

Prism Curve Table.

Upon the prism curve table, Fig 5, the curve marked J was constructed in the following manner :—A diagram similar to Fig. 2 was made for a prism having an angle ABC equal to 30 deg., and a large number of rays DB were drawn striking the prism, and the direction of each of these upon leaving the prism was ascertained. For instance, it was found that the light coming at an angle of 80 deg. from the vertical leaves the prism 7 deg. above the horizontal ; that a ray coming at an angle of 74 deg. from the vertical leaves the prism in a horizontal direction ; that a ray striking at an angle of 59 deg. from the vertical leaves the prism at an angle of 15 deg. below the horizontal. These various points were plotted on squared paper similar to that used in the curve table, and the smooth curve marked J on the prism curve table was drawn through these points. The curves for the other prisms were drawn in the same manner.

The numbers on the lower line of the prism curve table, 20, 30, 40, &c., are the zenith distances of the rays striking the prism plates. The numbers at the left side of the table are the directions in which the rays leave the prisms. H indicates the horizontal direction, the numbers below H indicate degrees below the horizontal, and the numbers above H indicate degrees above the horizonal. For instance, a ray striking the 50 deg. prism at an angle of 60 deg. from the vertical, leaves the prism in a horizontal direction. The ray striking this prism at an angle of 65 deg. from the vertical leaves 7 deg. above the horizontal, and the ray striking this prism at an angle of 50 deg. from the vertical leaves at an angle of 11 deg. below the horizontal. The prism curve table saves us the trouble of making a diagram such as Fig. 3 whenever we wish to change light from one direction to another. For instance, if we wish to throw light coming from an angle of 55 deg. from the vertical into a direction 1 deg. below the horizontal, we see at once that the 55-deg. prism will answer this purpose.

To Determine What Prisms to Place in a Window.

The general method of lighting by means of Luxfer Prisms, is to throw the light from the sky directly into the room. We treat the sky itself as a luminous surface. We do not derive our light from the sun directly. If we did this, we should need to change our prisms every hour of the day. The sky itself is very bright in comparison with ordinary objects. The light from the sky ordinarily falls upon a window and goes straight through and reaches the floor at a point not very far distant from the window. The floor is of a dark colour reflecting perhaps only one-tenth part of the light falling thereon, so that perhaps nine-tenths of the light is lost upon reaching the floor. If prisms are placed in the window the light is thrown directly back into the room before striking the floor. The first object which this light strikes is the one which we wish to illuminate, and in general it is of a light colour. The prism plate in the window practically takes the place of a skylight. It is to be thoroughly understood that prism plates placed in windows do not increase the quantity of light entering the room. They simply re-distribute the light in such a manner that it is utilised to a much better advantage.

Uniform Plate.

In determining the proper prism to place in any window, we must know both the direction in which the light falls upon the prism and the direction in which we wish to have the light leave the prism. If we know the direction in which the lowest light falls upon the prism, we know for ordinary cases that the other directions lie between this and the vertical, and if we know the direction in which we want the highest light thrown in the room, the other directions in which we wish light will be between this and the vertical in a downward direction. If we throw the light which falls upon the prisms in the lowest directions so that it leaves the prisms in the highest direction desired, then, in most cases, the other rays of light falling upon the prisms between the lowest direction and the vertical will illuminate other parts of the room which we wish lighted and our problem is substantially solved.

In Fig. 6, let L_1 be the lowest direction in which light falls upon the prism plate, and let

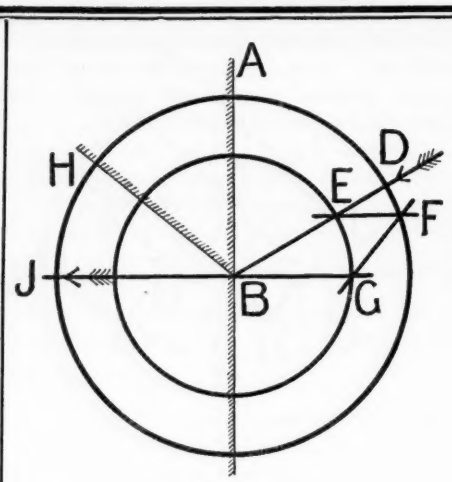


Fig. 3.

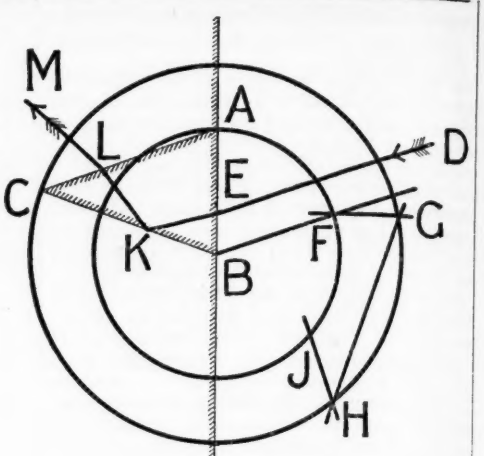


Fig. 4.

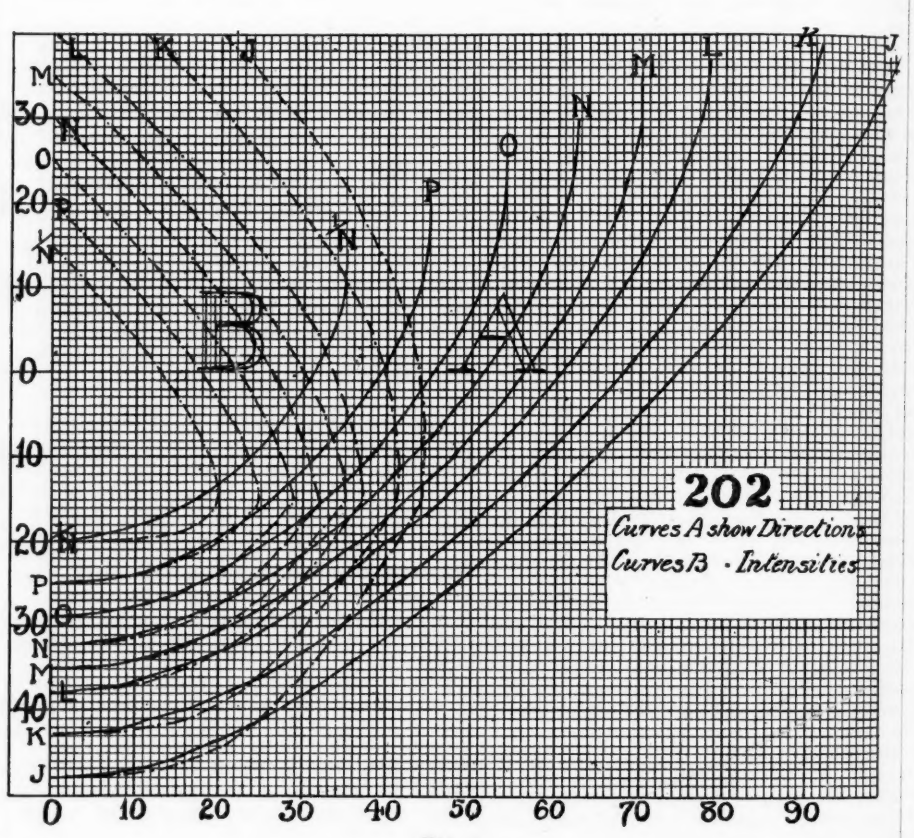


Fig. 5.

A be a desk which it is desired to illuminate and which is the object farthest back in the room and highest up from the floor that we wish to illuminate. If such a prism is placed in the window that the light L_1 (striking the lowest prism in the window) takes the direction D_1 (the direction from the lowest prism to the desk), then the desk A will be lighted by every prism in the window ; for, although the light L_2, which is parallel to L_1 and striking the upper prism of the window, goes above the desk A, there will be some other ray L_3 higher than L_2 which will take the direction D_3 and strike the desk. All the other rays above L_3 will go lower than D_3 and into the part of the room which we wish to illuminate, and practically all the light striking the window will be utilised.

If there is no prism which will throw the lowest ray directly upon the point desired it is usually best to select the one which throws the light above the point. In rough work it is sufficient to throw the light in a horizontal direction, and in rooms which require a general illumination it is better to throw the light rather high than to confine it too nearly to the floor. For the general effect of the window plate upon people inside the room, it is commonly best if there is light enough to spare to arrange the prisms so that none of them will appear dark to a person in any part of the room.

Plate of Varying Prisms.

It may happen, in case the prism plate is quite deep and in case the desk A is quite near the window, that it will be desirable to place a prism in the top of the plate which is different from that placed in the bottom of the plate. Suppose that we wish to place prisms in an upper sash 5 ft. deep, the zenith distance being 51 deg., and we wish to light a desk 20 ft. from the window, the top of which is 10 deg. below the level of the lower edge of the upper sash and 17 deg. below the upper part. Looking at the left of our table, finding the line of 10 deg. below the horizontal, and following it to the right, we find it intersects the vertical line marked 51 upon the L prism curve. If, therefore, we place the L prism in this window, we will light the desk satisfactorily, and the most of the remaining light will fall between the desk and the window. It may be noticed, however, that the K prism curve crosses the 51 deg. angle at 17 deg. below the horizontal. So that if we put L prisms in the lower half of our window and K prisms in the upper half, we shall accomplish the same result so far as the desk is concerned, and shall not throw so much light over the desk, but will save this for the space between the desk and the window, the area which we wish to illuminate.

Light Near the Window.

Referring now to the intensity curve table, it will be noticed that the space which before was brightest in a room is now left practically without light. The lowest light from the P prism is 25 deg. below the horizontal, from the N prism 32 deg., &c. It is evident, therefore, that there is a dark area in a room near the window. In order to obviate this difficulty, it is absolutely necessary in almost all cases to insert a few prisms of low angle in the prism plate. For instance, given a zenith distance of

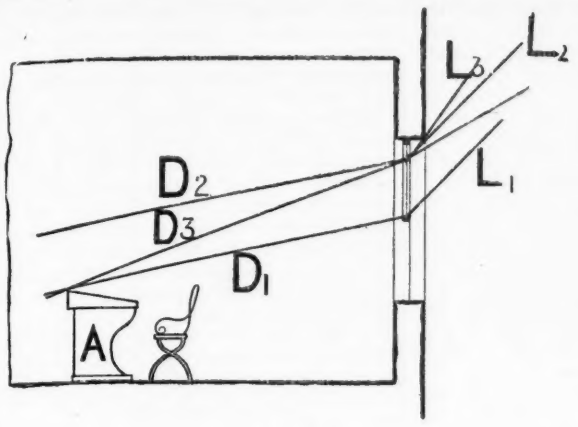


Fig. 6.

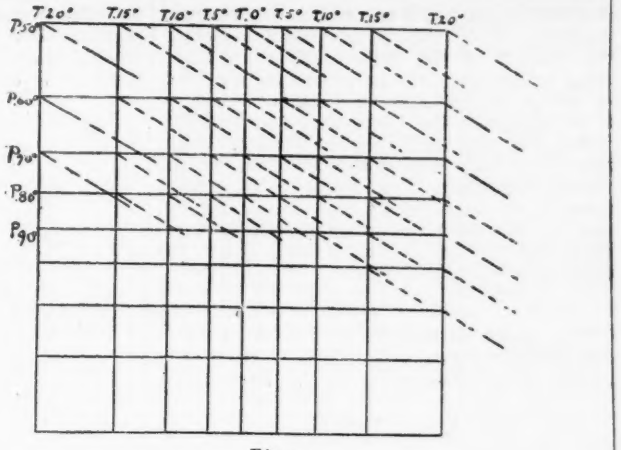


Fig. 7.

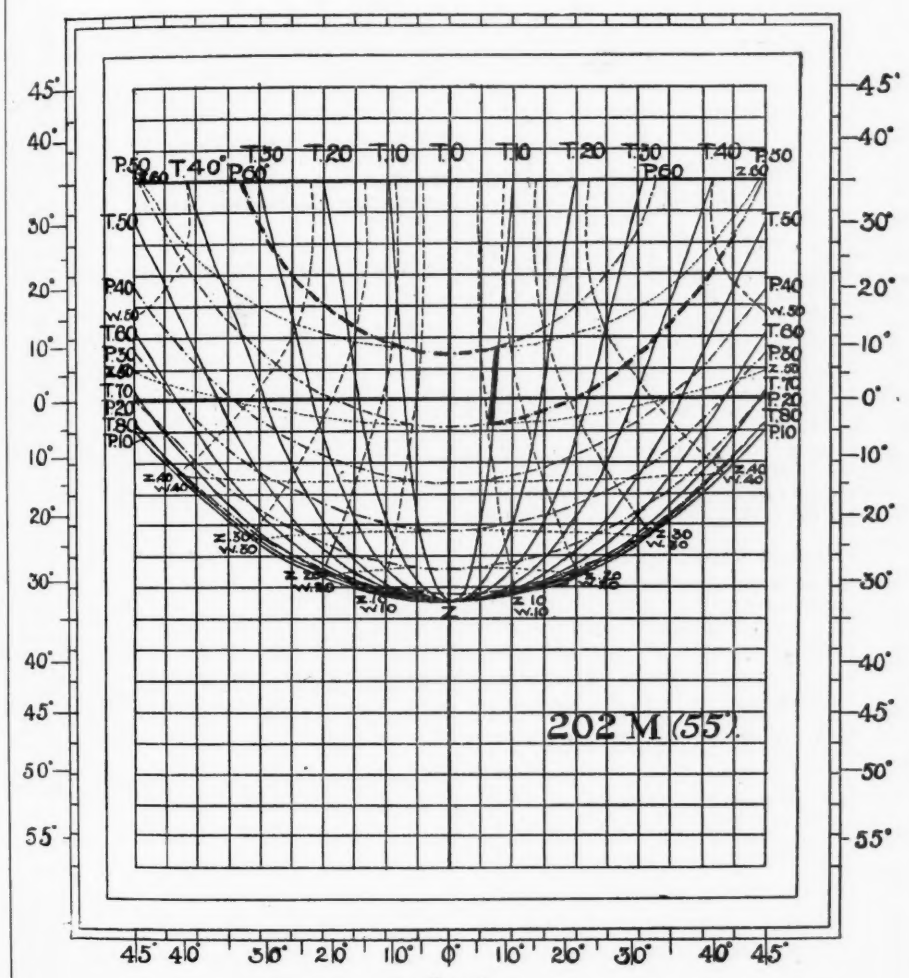


Fig. 8.

40 deg. we should probably choose either the 65 deg. or the 70 deg. prism for the body of the prism plate. Suppose it is 65 deg. The light from this prism goes down as low as 28 deg. below the horizontal, but for the last few degrees the light is not very brilliant, as indicated by the intensity curve to be explained later. In order to illuminate the area left dark, it will be necessary to insert either some J or K prism lenses. The quantity of the low-angle prisms can be obtained roughly by considering the area to be lighted by these and by the body of the prism plate. If the area to be lighted by the body of the prism plate is on the average 30 ft. from the window, and if the area to be lighted by the low-angle prisms is on the average 10 ft. from the window, then, since roughly the intensity of the light varies inversely as the square of the distance from the window, the proportion of the two window lights should be about as 100 is to 900. The proportion ordinarily used is from 10 per cent. to 20 per cent. As a matter of choice in the case illustrated above between the J and the K prisms, probably the K should be selected, simply as a matter of appearance. If the J prism were selected it would be possible to select a point in the room such that there would be a line of prisms across the window, all of which would be dark.

The method of using the intensity curve table rapidly is to select the prism, trace this curve down to the left-hand side, and then trace the horizontal line to the right back to the zenith distance and select the proper prism curve at that point for the low angle prism light. In many cases, even where the light is not required up close to the window, it is still advisable to insert a few of these prism lights of low angle in order to relieve the monotony of the uniform prism plate. This effect is seen both from the inside and the outside.

Back Wall Images.

The curve already described under the heading of "Prism Curve Table" is used for determining the distribution of light in the principal plane, that is, the plane perpendicular to the elements of the prisms. It does not, however, show anything definite concerning the light which passes through the prism plate in any other plane, and we, therefore, must make use of what is termed back wall images in order to determine the distribution of this side light. If the observer stand looking through the window to be treated, directly at the wall on the opposite side of the street, he may divide the surface exposed to view by a horizontal line at the level of his eyes and by another vertical line in a plane perpendicular to the prism plate. Let other lines be drawn parallel to the two lines mentioned and at distances of 5 deg. apart. The vertical plane forming the surface of the opposite building will then be divided by section lines, the intersections of which will determine points upon that surface. At the intersections of these lines let lines be drawn perpendicular to the plane of the lines. We now have three series of lines, Fig. 7, which may be taken as representing the principal edges of any building which may form an obstruction to the light which comes to the proposed prism plate. Thus a horizontal line would represent the top of such a building. On the diagram the horizontal lines are lettered "P." One of the vertical lines referred to, marked "T," would represent the side of the building. One of the last set of lines, lettered "W," would represent the retreating edge of the building.

Let us now imagine each of the three sets of lines to which we have above referred as constituting a source of light, that is, as being composed of molten platinum, so that as one viewed the surface each line would be distinctly visible. If we further use our imagination and consider that this triple system of lines be projected upon the back wall of the room to be lighted by means of the prism plate, we would have upon such back wall a distorted reproduction of the system due to the refraction of the straight lines into curved lines. If the prism plate were composed of prisms termed 202 M the result would be in effect such as is shown in fig. 8, which upon examination is seen to consist of three sets of lines, the T lines which represent the shadows of the vertical edges of buildings, the P lines and *w* lines representing the shadows of the horizontal and retreating edges respectively.

When uppermost edges of the buildings upon the opposite side of the street form a regular or straight line, the prism table referred to previously could be used, but when the horizon consists of an irregular line of buildings, for instance, when there is a tall building directly opposite the window and lower buildings to the left, it becomes necessay to use the back wall image. In the first place, the zenith distance of the uppermost horizontal edge of the building must be determined. Let us suppose this to be 55 deg., and that this line extends to the right indefinitely, and to the left until it intersects a vertical plane at an angle of 10 deg. with the principal plane to the prism plate. This line may now be traced upon the back wall image, and is shown as a heavy dotted P line. At this side angle of 10 deg. we assume that the high building terminates, thus exposing a vertical edge extending downward, and that the remainder of the horizon to the left is formed by a building the zenith distance of which is 60 deg. The vertical edge above referred to is found upon the diagram and is shown in heavy dotted lines, further the horizontal line is found to be as shown. The irregular line thus determined may now be traced upon the back wall, which is another vertical plane supposed to be at the rear of the prism plate a unit's distance or the distance represented by the width of the street. This shows accurately the dividing line between the illuminated part of the back wall and the dark part of the same, and it may be at once seen whether the various desks, &c., which are required to be lighted are within the range of illumination by the prism plate. If it be found that the prism plate examined does not throw the light high enough in the room, it will be necessary to further examine a plate supposed to be formed of prisms of a higher angle, and it may yet be found that the desired illumination is not

obtained owing to the higher building referred to above. It will then be possible to overcome the shadow of the high building by using tilted prisms, that is to use prisms the elements of which are tilted at an angle of from 30 to 60 deg. with the horizontal. Such prisms utilise the side light more effectively. Since there is a back wall image for each prisms whether horizontal or tilted, it is always possible to determine the distribution effected, and by the use of judgment to quickly determine the best prisms to be used under the existing conditions of light.

Prism Table.

The angles obtained from the use of fig. 2 are tabulated for the prisms J, K, L, M, N, O, S, and P, and are shown in fig. 9. To illustrate

PRISM TABLE.

Zenith Angles Deg.	J. Deg.	K. Deg.	L. Deg.	M. Deg.	N. Deg.	O. Deg.	S. Deg.	P. Deg
70	4'0	3'0	—	—	—	—	—	—
69	5'0	2'0	—	—	—	—	—	—
68	6'0	1'0	—	—	—	—	—	—
67	7'0	0'2	10'0	—	—	—	—	—
66	8'0	1'5	8'2	—	—	—	—	—
65	9'0	2'5	7'0	—	—	—	—	—
64	10'0	3'7	5'2	—	—	—	—	—
63	11'0	4'7	4'0	—	—	—	—	—
62	12'0	6'0	3'0	9'7	—	—	—	—
61	13'0	7'0	1'7	8'0	—	—	—	—
60	14'0	8'0	0'5	6'5	—	—	—	—
59	15'0	9'0	1'0	5'0	—	—	—	—
58	15'7	10'0	2'0	3'5	—	—	—	—
57	16'5	11'0	3'0	2'0	10'0	—	—	—
56	17'5	11'7	4'0	1'0	8'0	—	—	—
55	18'5	12'7	5'0	Hor.	6'5	—	—	—
54	19'5	13'7	6'0	1'5	5'0	—	—	—
53	20'0	14'5	7'0	3'0	3'5	—	—	—
52	21'0	15'5	8'2	4'0	2'0	—	—	—
51	22'0	16'5	9'2	5'0	0'5	—	—	—
50	23'0	17'2	10'5	6'5	1'0	10'0	—	—
49	23'5	18'0	11'2	7'5	2'0	8'0	—	—
48	24'5	19'0	12'2	8'5	3'0	5'5	—	—
47	25'2	20'0	13'2	9'7	4'2	3'5	—	—
46	26'0	21'0	14'5	11'0	5'7	2'0	8'5	—
45	27'0	21'5	15'2	11'7	6'7	0'2	6'0	—
44	27'7	22'5	16'0	12'7	8'0	1'0	4'0	—
43	28'5	23'2	17'0	13'7	8'7	2'0	2'0	—
42	29'3	24'0	18'0	14'7	10'0	3'5	0'7	8'0
41	30'0	25'0	19'0	15'7	11'0	5'0	1'0	5'5
40	31'0	25'5	19'5	16'5	12'0	6'0	2'0	3'5
39	31'5	26'2	20'5	17'2	13'0	7'0	3'5	2'0
38	32'3	27'0	21'0	18'0	13'7	8'0	4'5	Hor
37	33'0	28'0	22'0	19'0	14'7	9'2	6'0	1'0
36	34'0	28'5	22'5	20'0	15'5	10'0	7.0	2'5
35	34'5	29'2	23'3	20'3	16'0	11'0	8'0	4'0

Fig. 9.

the use of this table suppose we require to find the proper prism to use in a window facing on a street 40 ft. wide, the buildings on the side opposite the window extending to a height of 31 ft. above the window; by laying out the width of street and the height of building on a drawing board, or by reference to a table of trigonometric functions, we find the zenith angle to be 52 deg. Entering the table in fig. 9 with this angle, and assuming that we require the highest light to be about horizontal, we find that the prism which most nearly answers the purpose is the N, which throws the 52 deg. light 2·0 deg. above the horizontal.

Luxfer Prism Protractor.

This is a very ingenious invention, the object of which is to approximately and quickly determine the prism which may be placed in a window in order to throw the light into the room in a horizontal direction. It consists of a transparent celluloid disc with the diagram, fig. 10, impressed upon its surface. A section through the window, the street, and the opposite building is laid out on paper to scale; a line is then drawn from the lower edge of the prism plate to the top of the building opposite; the protractor placed upon the diagram in proper position, as shown, at once indicates the prism to be used. The candle-power of the prism and the page in the "Luxfer Prism Manual," which very exhaustively describes the prism and the way in which the light will be distributed by it. This protractor, of course, deals only with light in the principal plane, and cannot be used in cases of a very irregular horizon.

Canopy Curves.

The diagrams and tables considered up to this point have referred to sash or refracting prisms, but it is also necessary to study the distribution of light by the canopy or reflecting prisms. This distribution depends mainly upon two values, viz.:—The zenith distance and the slope of the canopy, this latter being the internal angle between the canopy and the vertical. The intensity of the light coming from a canopy prism under the various conditions of slope and zenith distance has been

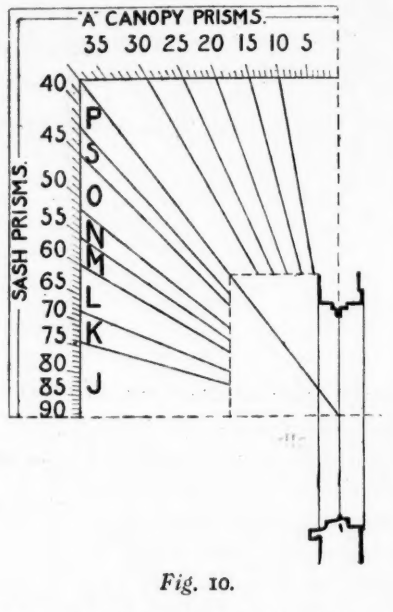


Fig. 10.

determined by the use of a photometer. The measurements so obtained are plotted and curves formed by reference to which the proper slope of the canopy may be found when the zenith distance is down.

Luxfer Prism Candle-power.

The first question asked by one considering the use of Luxfer Prisms is—how much light will they give? and it is in order to give an intelligent reply to this query that a table of Luxfer Prism candle-powers has been evolved (fig. 11). The first problem to be solved in this

PRISM CANDLE-POWERS.

Advised for Rooms Lighted from the End.

Width of Room, in Feet.	Length of Room, in Feet. 20	30	40	50	60	70	80	90	100
10	260	280	320	360	420	480	550	630	720
15	370	410	460	520	600	690	800	910	1050
20	480	540	600	670	780	900	1050	1190	1380
25	580	670	730	820	950	1100	1300	1470	1710
30	750	810	870	960	1120	1300	1550	1760	2040
35	880	940	1020	1120	1290	1500	1760	2050	2390
40	1000	1080	1160	1280	1480	1720	2000	2330	2700
45	1140	1210	1300	1440	1660	1930	2290	2620	3030
50	1270	1350	1450	1600	1850	2150	2540	2910	3360
55	1380	1480	1590	1760	2040	2370	2790	3190	3690
60	1540	1620	1740	1960	2220	2580	3040	3480	4020
65	1660	1760	1890	2080	2400	2790	3290	3770	4350
70	1800	1900	2040	2240	2580	3010	3540	4050	4680
75	1890	2040	2190	2400	2770	3230	3790	4340	5010
80	2060	2180	2340	2560	2950	3450	3980	4620	5250
85	2150	2320	2490	2720	3140	3670	4290	4910	5670
90	2340	2460	2640	2880	3320	3880	4540	5190	6000
95	2420	2600	2790	3040	3510	4100	4790	5480	6330
100	2540	2740	2940	3200	3690	4320	5040	5760	6660

Fig. 11.

connexion is the c.p. of the source of light, in other words the c.p. of the sky. This has been determined by actual measurement, and for the purpose a series of observations extending over a period of five months has been made at the Chicago Luxfer Prism Laboratories. Observations were taken three times a day at 9 o'clock, 12.30, and 4.30. The result has been used as a basis upon which to estimate the c.p. of a square foot of the various sorts of Luxfer Prisms most in use. The results are tabulated as follows:—

J prisms, 13 c.p. per sq. ft.
K " 12 " "
L " 11 " "
M " 10 " "
N " 9 " "
O " 7 " "
S " 5 " "
P " 4 " "
A " z.d., 35 deg. 9 c.p. per sq. ft.
A " z.d., 30 " 8 " "
A " z.d., 25 " 6½ " "
A " z.d., 20 " 5½ " "
A " z.d., 15 " 4 " "

It is found by experience that a certain candle-power in a room of given length and width is necessary in order to produce a desired illumination. The values of the required candle-power for various sized rooms varying in length from 20 ft. to 100 ft. is shown in tabular form. If we have a room 25 ft. wide and 40 ft. deep, we find by entering the table with these values a required candle-power of 730, and if the zenith distance be such that "M" prisms will light the room, the candle-power of "M" prisms under proper conditions being 10 per square foot, the required area in square feet of prism plate to give a first-class illumination is 73. This, of course, will give the required degree of illumination in the back part of the room. If it is not necessary to illuminate the room to such a high degree, a less area of prisms may be used with satisfactory results.

It will be seen by the foregoing that the object of the designers of Luxfer Prisms has been to properly distribute the light which is available, and that in the case of refracting prisms they do not attempt the impossible task of increasing the amount of light entering a window. In the case of the 303 "A" prism which is used as an outside canopy or reflector, the result is produced not only by a better distribution of light, but by an actual increase of light entering the window.

In the case of basement lighting the same principle applies as in lighting by means of vertical window prisms, the object being to effect a better distribution of the light, making the glass area of the pavement light as large a percentage of the total area of the light as possible.

Fig. 12 shows a suggested section, where a light well has to be used, for getting the

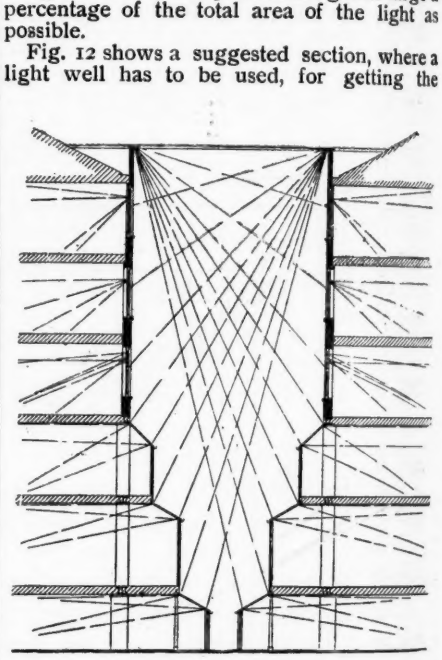


Fig. 12.

maximum amount of light into the building. The skylights to the basement, ground, and first floors would be glazed with Luxfer Prisms, and the upper sashes of second, third, and fourth floors. The dotted lines show how the light would be deflected by the prisms.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W. Mr. H. T. Hare presided in the absence of the President, Mr. W. H. Seth-Smith.

The minutes of the last meeting having been read and confirmed, Messrs. W. Boyd, H. Lawrence, H. Prince, and E. R. Sladen were elected members of the Association.

The Chairman announced that Mr. H. D. Searles-Wood had consented to act as a trustee of the Travelling Studentship Fund.

House List.

The meeting having approved of the nomination,

The Chairman read the House List for the next session, as follows:—President, Mr. W. H. Seth Smith; vice-presidents, Messrs. G. B. Carvill and E. Guy Dawber; committee (ten to be elected), Messrs. H. R. Appelbee, C. H. F. Comyn, A. C. Dickie, R. H. Weymouth, F. B. Clapham, W. H. Raffles, W. A. Pite, A. H. Goslett, W. J. Tapper, Hon. A. McGarel Hogg, L. Ambler, A. Bolton, W. A. Forsyth, H. T. Hare, Arnold Mitchell, G. H. Fellowes Prynne, and E. Howley Sim; hon. treasurer, F. G. F.

Hooper; hon. librarian, F. J. Osborn-Smith. Other officers:—C. H. F. Comyn and W. A. Jeckells, assistant librarians; Messrs. R. S. Balfour and H. P. G. Maule, hon. secretaries; Messrs. E. Greenop and G. M. Nicholson, hon. auditors; Mr. W. H. Jamieson, hon. solicitor; and secretary and registrar, Mr. D. G. Driver.

The Chairman said that it was open to any member of the Association to nominate other names before the next meeting.

The Chairman also announced that the following reply had been received from the King to the address of condolence recently submitted by the Association:—

"SIR,—I am commanded by the King to convey to you hereby his Majesty's thanks for the loyal and dutiful address from the members of the Architectural Association, expressing their sympathy with his Majesty and the Royal Family on the occasion of the lamented death of her Majesty Queen Victoria.—I am, sir, your obedient servant,

C. T. RITCHIE."

Small Suburban Houses.

Mr. H. D. Searles-Wood then read the following paper on "Small Suburban Houses":—I have no idea how the Committee intended this subject to be divided between Mr. Appelbee and myself, but as I suppose the most useful purpose would be served by each of us speaking from his own experience the things that he has learnt, I propose to deal with houses of the rental value of from 80*l.* to 200*l.*, Mr. Appelbee having kindly undertaken to treat on houses of the terrace and small semi-detached types.

There is one catch phrase current which it seems impossible to keep out of any conversation at the present time; I mean the reference to the man in the street. Well, I take it that the majority of him live in either one or other of these various types of house.

One of the peculiarities of the suburban tenant is that he seems to wear the neighbourhood out in the first term of the tenancy, and it thus happens that the oldest inhabitant in most suburbs has been in occupation about seven years. Now, this being the case, it is obvious that in planning these houses they must be designed to suit the multitude, and not individual tastes.

The man in the street is a man of social habits, with a fairly large circle of acquaintances. Let us take a typical family, consisting of the father and mother, with a grown-up family of four, two boys and two girls. The father and two boys playing golf and billiards, the mother and girls devoted to cards. Now, what should be the proportion of the various rooms to suit such a family, supposing we fix the rent at 200*l.*, and give an acre and a half of ground at 25*l.* per acre per annum. This leaves in round figures 3,000*l.* on a 5 per cent. basis as the cost of the house. The relative size of the several reception-rooms is the first consideration. The views of the man in the street and his wife are apt to differ in regard to which should be the larger, the drawing-room or the dining-room. I get over this difficulty sometimes by making the drawing-room, dining-room, and billiard-room all the same size, and it makes a very satisfactory house, but I find it better to give the advantage to the drawing-room as being the room in which most of the social functions take place, and the general living-room. I know it is difficult to convince the mere man that this is the case. Pipes and the old clothes dear to the heart of every man lose some of their flavour or comfort in the surroundings of the drawing-room, and hence, as I say, the mere man is apt to rebel at the drawing-room being larger than the dining-room; but my experience is that in the inevitable compromise the drawing-room comes out the larger room. In houses of this kind I find that the luxury of a large hall cannot be afforded; it is a beautiful feature in large houses, but where it can only be obtained by the sacrifice of size in the dining-room and drawing-room, I am convinced it does not pay. (I generally lay a parquet floor in the drawing-room, though nowadays dances are generally given in the various public halls that are found in most suburban districts.) I had some few years ago to advise trustees as to advancing their money to build a small house for a young couple who were just married, who thought they would like a quaint little house built out of the wife's trust money. When the plans were submitted to me I reported that in the event of the house being to let considerable additions would have to be made. I remember one of the features was a large entrance-hall, which was obtained by making the dining and drawing-room a combination. The drawing-room one end of the room, and the dining-room the other end. In spite of my advice the house was built and occupied by the young couple for, I think, about two years, and they then took an ordinary house in the country, the quaint conceit remaining empty for over a year, and was then let to a tenant who insisted on the trustees adding another wing with a dining-room and some other accommodations that by no stretch of the imagination could be considered quaint. This incident has often occurred to me when I have seen similar designs in the professional papers, and I wonder what alterations will be made in the course of time, and such thoughts as these have a chastening influence whenever I feel disposed to attempt the unusual. I hope I shall not be misunderstood. I have a great admiration for the work of many of our talented architects whose houses will always interest; but small surburban houses must to a certain extent follow the more or less stereotyped plan which, after all, is the concentrated experience of many generations of builders.

I personally have a great objection to that form of hall which consists of a passage from the front to the back of the house. It quite, to my mind, destroys the comfort of the hall, and in small houses I think what is called the garden entrance is unnecessary. I like also, if possible, to shut off the staircase from the hall.

The position of the billiard-room in relation to the house wants careful consideration. I always try and make a separate approach to the billiard-room from the outside. In the suburbs it is usual to have certain evenings in the week for billiards, when it is understood that your friends will drop in without a special invitation for a friendly game, or to play in a handicap. If there is a separate entrance these visitors can come into the room without disturbing the other members of the family, and can leave without rousing the household if the billiard-room is kept open late. It always seems to me that a billiard-room in a small house such as we are now considering is an expensive feature, if you look at it in the light of the largest reception-room in the house being devoted to a game which on the average is not played for more than four hours a week. To obviate this, I have found Burnett's patent machinery for lowering the table into a pit and allowing a floor to be laid over the space makes this room available for other purposes of entertainment. This machine consists of four screws which work in a steel frame, and are connected by means of bevel cogs so as to all work together and thus prevent the travelling table jambing; the screws bring the table up to the steel bed plate, and the table comes up each time to a dead level. When the table is lowered a beam of oak is laid across the opening and the flooring, made in convenient widths, is laid down on the beam and the ends caught by a hinged board secured with cups and screws which hold the false floor in its place. It takes about twenty minutes to get the table down and the false floor laid, and about thirty minutes to get the table back again and the false floor stowed away in the pit.

I find it suits the man in the street to give him a dining-room, drawing-room, and billiard-room, the last taking the place of the small sitting-room usually called the morning-room or library on the ground floor. The billiard-room in this case has usually a writing-desk in it where the men of the family do what writing they have to do, and, in fact, use it as a general morning-room. This room should always be heated by hot-water pipes. Nothing is more miserable than to go into a cold billiard-room after dinner, and the open fire is apt to make one set of cushions softer than the others. If this plan is adopted the ladies want a room upstairs for work, and this can often conveniently be made in the attic, and when so placed piano or violin practice can be indulged in without stint for fear of the feelings of the rest of the household.

The relative position of the kitchen to the dining-room is another point which regulates the plan to a great extent so as to avoid as much as possible having to cross the house in serving the meals; but it is a moot point whether, in the sized dining-rooms that are usual in the class of house under consideration, two doors—one from the hall and one from the service passage—are not more conducive to draught than the convenience of the service warrants. But I am not in favour of hatches.

The dining-room should never be less than 15 ft. for the convenience of serving round the table. A recessed fireplace on the side is also a pleasant feature, and gives interest to the room.

The kitchen should be so placed that the housemaid's pantry can be reached without passing through the kitchen. This pantry should be as large as possible, and all the glass and silver should be washed and cleaned in it.

The kitchen should also be a good size. It should be remembered that, in addition to the work of preparing the food, it is the living-room of the servants. It is not usual, in houses of the size we are considering, to provide a servants' hall, and therefore the kitchen should be made larger to suit the double purpose. Good light on the right-hand of the range is very important, and a cheerful outlook, if possible. In these houses I always make the boilers in the ranges of the kitchen and scullery both work the hot-water system, so that when in the summer the cooking is done on the smaller range, there is still a circulation of hot water over the house. I find it a good plan also to have a copper cylinder on the floor on the first floor as well as the hot tank in the cistern room. This cylinder heats the linen-closet and gives a good storage of hot water.

If the family are given to taking cold baths in the morning there is a great run on the bathroom, and I find that a second bathroom is a good feature, if possible; but if not, a spray bath on the head of the slipper bath enables the bath to be used much more quickly.

The staircase is one of the few opportunities in a house of this character that offer scope for a little careful detail. Of the three types of stairs—the open well, the dog leg, and the stairs between walls—I fancy the last gives a little more mystery to the planning, the upper floor not being disclosed until the half space is turned. A second staircase is a good feature, if it can be arranged.

For the family we are planning for, eight bedrooms, a dressing-room and a workroom at least are needed. As a comparison, taking the area of the rooms on the ground floor as 100, the following is the proportion of the plan marked A:—

Billiard-room...	24	Bedroom ...	12
Drawing „ ...	19	„ ...	7
Dining „ ...	15	„ ...	16
Hall.....	11	„ ...	15
Kitchen	9	„ ...	9
Scullery	5	„ ...	9
Staircase.....	4	„ ...	5
Housemaid's pantry, cupboards, water-closet, and lobby	13	„ ...	9
	100		82

We have been considering a plan for a house of the rental value of 200*l.* Now let us see what reductions are required for one of 80*l.*

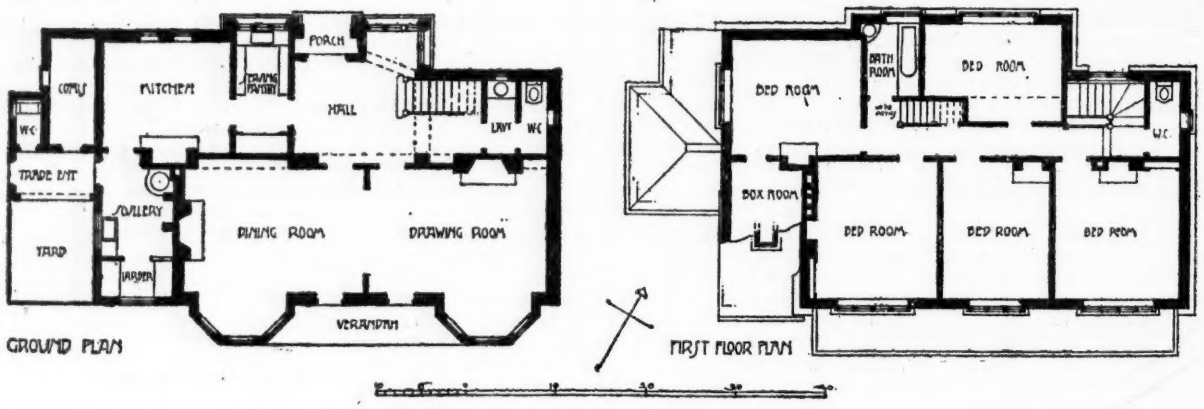
We will take the ground as a third of an acre. This would represent a plot 60 ft. by 240 ft., and the ground rent would be 13*l.* 10s. This leaves, on a 5 per cent. basis, 1,300*l.* for the house.

I make the dining-room 16 ft. by 16 ft., with a large bay, the drawing-room 16 ft. by 15 ft., with folding doors into the hall, which is arranged so as to be used as a morning-room, or in conjunction with the drawing-room. The vestibule is approached through the housemaid's pantry, thus allowing the servant to answer the door without passing through the hall. The housemaid's pantry is arranged with a large gas-stove, so as to make it a summer kitchen. The kitchen is a fair size, with a scullery as a place for dish-washing only.

On the first floor are four bedrooms, corresponding in area to the four rooms on the ground floor, the bathroom and water-closet being over the vestibule. In the attic are two bedrooms, dressing-room, linen-closet, and cistern-room. I think it is very important, from a sanitary point of view, to put the cistern in such a position that it can be readily and easily examined.

Making the same comparison as before, the areas are:—

Dining-room	30
Drawing-room	28
Hall	10
Staircase	6



A SMALL SUBURBAN HOUSE. H. R. APPELBEE, Architect.

Kitchen	13
Scullery	4
Housemaid's pantry	6
Lavatory	3
	100

This house, with reduced area, still gives good accommodation for reasonable social usages, and in both you will see the endeavour has been to work out the plans with the minimum amount of passage-ways. I think that this has been overdone myself, and both plans would be improved by more space in the staircases; but this would have been at the expense of the rooms.

In giving the percentage areas I have been endeavouring to arrive at the just proportion between the various rooms in houses such as we have under consideration. It appears to me that it would be a useful table if we could arrange some such scale. The problem appears to me to be as follows: Given the rental value of the house and no conditions as to the size of particular rooms being imposed, what has been found to be the relative area of each room as the result of experience?

Of course, having fixed the areas for the ground floor, the other floors must follow more or less these dimensions. The comparison also depends on the houses compared being equally well built.

I have now described two plans at either end of my scale. The intermediate plans show a gradual increase in the scale of the accommodation, and you will find that as you rise from the lower to the higher rent the tenants become much more exigent. The question, I think, that would be most profitable to discuss is whether modern planning is abreast with the spirit of the age. Most buildings designed for particular purposes nowadays are highly specialised. Do our domestic buildings compare successfully with these specialised buildings in suiting the requirements of the persons occupying them, or are they governed by considerations other than the needs of the tenants, such as the reproduction of old buildings whose appropriateness to modern usage is rather open to question?

Mr. H. R. Appelbee then read the following paper on the same subject:—

It is impossible in the time at my disposal to-night to do more than glance at a few of the points which influence the design of small suburban houses. My illustrations are limited to houses of not more than ten rooms, and of these I have excluded the very smallest where it is probable no servant would be kept. Also excluded are houses having rooms for special purposes, such as doctors' and artists'.

The first point to influence the design is the site. It is obvious that all, especially in London, cannot have the advantages of building on gravel or high land, but the selection of a particular road is open to most. Personally, I would not care to own a house in a road running east and west, or, even worse, north-west to south-east, unless the site is large enough to permit side lighting as well as from front and rear.

Rooms should be so arranged that the sun may enter at least once every twenty-four hours. This is not always possible; but to arrange living-rooms where it is impossible, even during long summer days, seems to me little short of criminal. Great care is, however, necessary, as different rooms require the sun at different times of the day, the general rule being that it follows with our day's work; our bedrooms should face the east or south-east, the breakfast-room south-east, the drawing-room south to south-west, the kitchen south-east, while a study or library north, with a sunny window as well, or east. In a terrace house the fronts should be south-east and north-west; in others where side light is also obtainable more latitude is permissible.

As to prospect, it is nearly always the same thing for the dweller near a large town—buildings everywhere. There should, however, be trees both in the road in front and in the garden, and creepers on the house itself.

The next point that will come under consideration is the cost, which will fix the size and number of the rooms and the amount that can be expended on their fittings and decoration. The common system of making approximate estimates by cubing or areas is apt to be very misleading. For example, the areas of all from the sitting-rooms to the pantries may be increased by 50 per cent., while the cost is only increased about 20 per cent., assuming that the heights are kept the same and the fittings of the same quality.

To illustrate this take a terrace house 16 ft. between the party walls and 25 ft. from front to back:

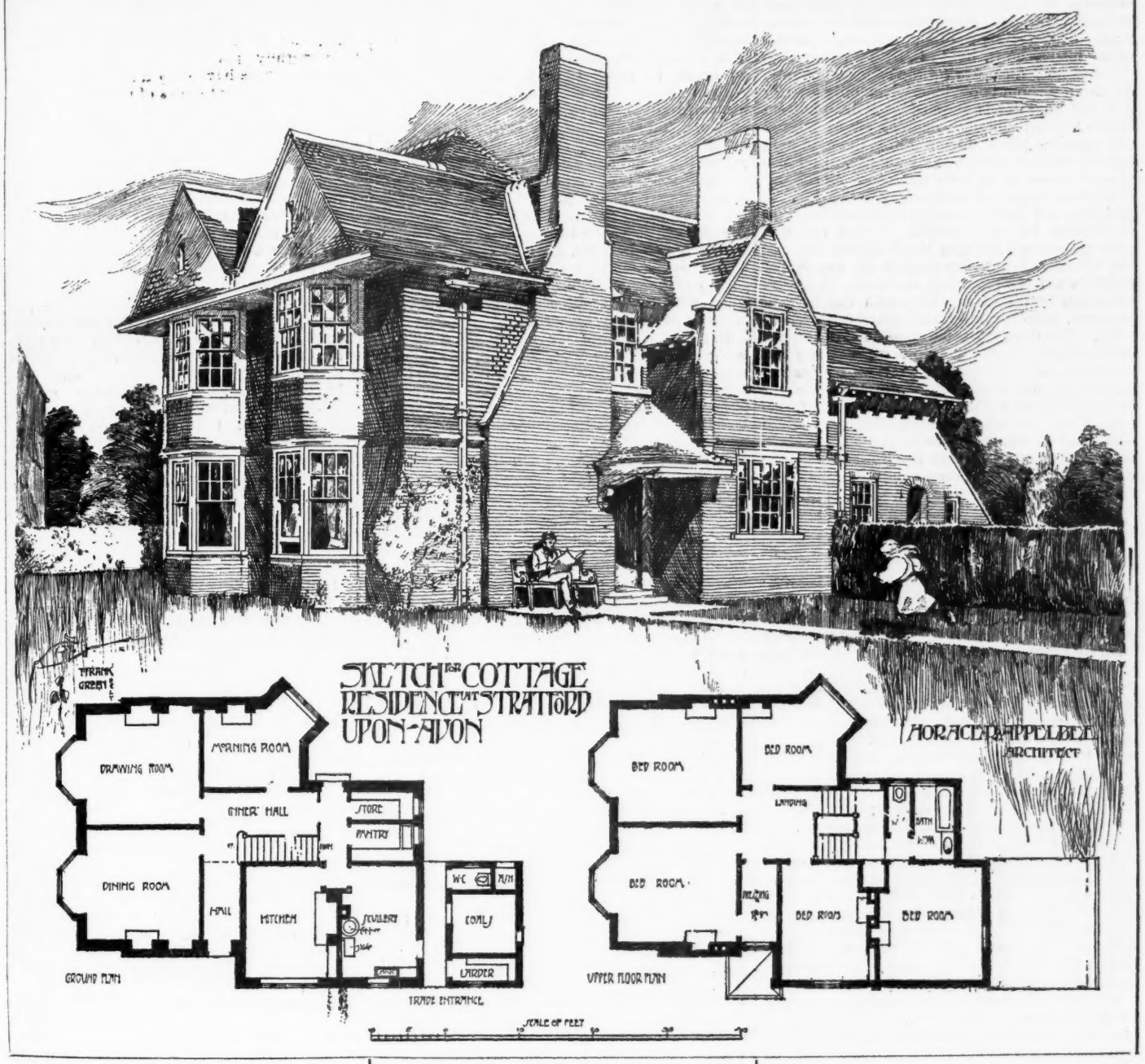
area = 25 ft. by 16 ft. = 400 sq. ft.

Enlarge to 20 ft. from party wall to party wall and 30 ft. from back to front:

area = 30 ft. by 20 ft. = 600 sq. ft.

Assume the heights to be the same and compare the cost.

Party walls 50 ft. and 60 ft. long = 20 per



cent. increase, front and back walls 32 ft. and 40 ft. = say 20 per cent. increase (is really rather less). Skirtings and cornices will follow the walls. The finish to floors and ceilings and the roofing will obviously show a 50 per cent. increase. The joists of the upper floors will, however, show more, and more depth being required owing to increase of span, and will be found to require in the particular instance quoted an additional 20 per cent.

Many items require no increase whatever, *i.e.*, range, copper, stoves, and mantels. With the drainage and plumbing work, which is very expensive, the main items of manholes, vertical soil pipes and service pipes, bath and water-closet apparatus and sinks are not increased, and it is only the horizontal pipes between them and these to the very small amount of 20 per cent.

For the purpose of this paper I have analysed the bill of quantities of a 1,450*l.* house, and I find on the above principles

About	£240	with no increase =	£240
"	930	" 20 per cent. " =	1,107
"	280	" 50 per cent. " =	420
		And for extra depth of floor joists, say...	13
	£1,450		£1,780

or between 22 per cent. and 23 per cent. increase of cost for 50 per cent. additional accommodation. This point is somewhat emphasised because its not having been realised seems to account for much of the cramped accommodation we shall find in the plans appended.

While on the subject of cost, a word of warning should be said on what is perhaps the greatest architectural sin of the Victorian age, viz., the façade built in a more expensive manner than the return faces. This arrangement gives a thin cardboard-like effect and entirely destroys architectural solidity. It would be cheaper as well as more artistic to build the main front of similar materials to the sides and back. Perhaps a new reign and new century will alter this.

The first sketches should always show the principal furniture, and the relationship of doors, windows, and fireplaces should be considered with regard to each other and to the furniture.

Inside v. *Outside Chimneys.*—If the fires are well grouped, two or, at the most, three chimney-stacks will be required. If they are on inside walls, the house is more economically warmed, and there is less chance of a down-draught from a cold flue. On the other hand, a compact plan usually brings the internal doors together around a small hall or landing, and in order to prevent the doors spoiling the sitting space around the fires or the plan from becoming straggling, the chimney breasts have usually to be planned in the outside walls.

The Casement v. *the Double-hung Sash.*—The double-hung sash is unquestionably convenient for lighting, ventilation, cleaning, and it is easy to keep clear of blinds or curtains; it is easily made weathertight and is simple to fasten, but it probably requires more skill to make its appearance equal to that of a casement. The mullioned window, especially when long and low and without a transome, is undoubtedly picturesque. The casements are difficult to keep weathertight unless they open outwards, in which case one at least of an odd number of lights can never be cleaned from the inside of the room, and they interfere with flowers on the window-sill. An even number of lights for cleaning purposes must have all to open in pairs. Opening inwards overcomes the cleaning, which is perhaps the greatest difficulty, but makes others with blinds, curtains, or a window-seat, and the absence of the weathertight qualities.

The Dining-room in a house of this class is the most important room, and in planning this the furniture should be sketched in, and its dual use as room for meals and the family sitting-room taken into consideration. A dining-table varies from 3 ft. 6 in. to 4 ft. 6 in. wide, and there should be room for one 6 ft. to 7 ft. long, and more at times, and a sideboard, one or two armchairs, often a couch or settee; and if there is no study, the books of the house and a writing-table will be here also. The room, therefore, should not be too small (as it often is), and in this room in particular it is well to remember that doubling the area will not double the cost of a room. The best aspect for this room is south-east. Where this room is general living-room as well as dining-room, a large bay or transept, making the room "L"-shaped, gives an interesting as well as convenient room. The bay is purely living-room, the other end of the "L" having the dining-table, the remaining portion has the fireplace, and may be considered as belonging to each branch of the "L" in turn.

The Drawing-room in small houses should be generally somewhat smaller than the dining-room, and is pleasant if it has the afternoon sun.

A Third Sitting-room is a useful addition, and if on special occasions it can be thrown into connexion with one of the others, so much the better. It serves as a breakfast-room the day the dining-room is "turned out" (in one house I know the hall serves this purpose well, callers being unlikely at so early an hour). Its chief use will vary very much in different houses, as breakfast-room, morning-room, library, and den.

Bedrooms, &c.—Roughly one-third of our

time is spent in bed and, therefore, the bedrooms of the house should have particular care in their planning. An adult should have from 1,200 to 2,500 cubic ft. of air per hour, equal to a room nearly 20 ft. by 13 ft. by 9 ft., therefore the necessity for ensuring the repeated change of air in a room is obvious. Not only an exit flue but an inlet is required. A deep bottom bead on a sash window enables air to enter at the meeting rail, I do not think the casement can be made to give this advantage. Sun also is very essential to keep the room sweet and healthy and should enter early in the day. A bedroom hot in the evening from a setting sun is disliked by most people. If the room is near an internal angle of the building, see that the window is not commanded by one in the return wall. In planning the room, show the principal furniture, the bed, with the light, if possible, from the side and space for a wardrobe. The dressing-table should have the back of the mirror to the window or between the windows if there are two; consideration should also be given to the morning opening of the window without having to move furniture first. In artificially lighting this room one light should be so arranged with regard to the dressing table, that the light falls on the dresser's face and not on the mirror. In a small room, if the bed occupies the position already suggested, this one light will probably serve the whole room. If electric, it is convenient to be able to switch it on and off from either the door or while lying in bed.

Bath, Lavatory, and Water-closet.—In connexion with the bedrooms the bath-room will be much used; in these small houses it assumes a much greater relative importance than in large houses. In addition to the bath there should be a fitted lavatory, both to have hot and cold water (this arrangement means a great saving of labour in the house by lessening the amount of hot and cold water carried to each bedroom, and subsequent removal of slops.) Some polished copper hot water rails for airing towels are useful, and help to warm the room. The bath most commonly used has a roll top edge and no casing; this seems to me a great mistake. As a rule, casings should be omitted whenever possible, that every part may be kept clean, but a bath is so big in bulk and has usually to be placed against the wall so that no one can possibly reach over to clean the vertical space between the side of the bath and the wall. The shallow space between the bottom of the bath and the floor is almost as bad. Splashing over of water, often soapy, is inevitable, and the dust clings.

As near as possible to the bathroom should be the upstairs water-closet, but never in it, although one sees illustrations of this. These two apartments seem to be the most difficult of all to arrange; they should be near the bedrooms, since the bathroom partially acts as a dressing-room, yet so retired that persons using the water-closet should not advertise their movements all over the rest of the house, and to this end do not permit any borrowed light from one or the other to a neighbouring passage, and be very careful in the selection of the water-closet apparatus and the water waste preventer that they may be as silent as possible. Next it is most important to remember that a water-closet is not merely an apartment 6 ft. by 4 ft. or thereabouts which may be partitioned off anywhere. It must not be overlooked that it is often 30 ft. high; in other words, the soil-pipe is an essential part of it, and if you place a water-closet on the principal front near or over the entrance door, this soil-pipe and the ventilation pipe which extends it, will spoil the effect of everything. Bath and lavatory wastes are nearly as bad. Over the scullery, or some of the adjacent pantry or kitchen parts, is the natural place; but see that the water-closet is not over the larder—a point to which it always seems to gravitate. All places having water supplied to them should be as near to one another as possible, for economy of pipe work and also because of accidental overflows; a long distance, too, from the kitchen boiler to the bath or lavatory generally means that the circulating pipes have to cross hall or sitting-room; and as few people care to see them exposed here, they get boxed up in floors and other improper and inaccessible places. To sum up this part, the bathroom and water-closet should be regarded as very large, their wastes extending down to the drains, their supply and ventilation pipes go up to the cistern and ridges of roof, and the bath has also a horizontal extension to the kitchen boiler.

The Kitchen, Offices, and Servants' Quarters in small London houses are usually very cramped and deficient—at least, to those like myself who have had some country training first. The points about increase of size should be borne in mind here in particular. The kitchen is also the servants' living-room, and therefore should have as good an outlook as possible, and some sun, preferably in the early morning. Adjoining should be the scullery, primarily intended for the keeping and cleansing of the cooking utensils and the rougher part of the preparation of the food, but many other duties are now thrust on to it. It is the place where nearly all the dirty work of the house is done, such as cleaning boots and knives, trimming lamps, washing up greasy plates and dishes; it is also frequently fitted with a gas stove, and becomes the chief cooking place in hot weather.

It needs a copper for the rougher laundry work that is always done at home, it is also the storage place for brushes and brooms, and we are frequently asked to believe that a space about 6 ft. square is all that is necessary. The larder must be placed so that it can be kept cool and away from the steam of the scullery copper. A lock-up store should be provided, where the lady of the house will keep extra groceries in reserve and where best dinner and other services and glass are kept. An exceedingly useful addition, even in the smallest house, is a china or housemaid's pantry provided with a lead-lined sink. Here tea and breakfast services are washed and stored, also plate and glass. Table-linen is also kept here. By attending to the lighter work here, the mistress and young ladies of the house can assist without interfering with the servants. If planned as an ante-room between the kitchen and main house, it will also act as a ventilated disconnecting lobby, and help to prevent an unavoidable cookery smell extending all over the house.

The Stairs may be made the most picturesque part of the house, but they must be practical also; they will have to be used by the very young and the infirm. Winders are often dangerous, and should never be curved on plan (as they often are at the foot of the stairs) if it is intended to carpet them. Bulky furniture will also have to go up and down and at times a coffin.

The Plan.—The width of the site is the next point that will determine the plan. Narrow sites must make the house one of a row; at 25 ft. it is possible to make it "semi-detached"; 40 ft. to 50 ft. is the least on which the smallest detached house will look well.

The varieties of plan possible are more than, I think, is commonly supposed. In a terrace-house the simplest is to put two rooms on a floor facing the front and back of the site, respectively, a part of one being cut off for the staircase, or the staircase may be put in between them. In these cases the kitchen and offices occupy a basement story, two sitting-rooms on the ground floor, with probably two floors of sleeping-rooms over. Constructively cheap, owing to small amount of foundation and roofing (which the increased thickness of walls will not outweigh). They are very inconvenient, owing to the amount of stairs. There is, of course, three times as much staircase in a four-story house as in one of two stories. The first variation is to bring the kitchen to the ground floor in a wing behind the stairs, with the result that the look-out from one sitting-room is quite spoiled, the scullery or coals enjoying the view. Another arrangement transposes sitting-room and kitchen department, opening the kitchen from the centre of the house. In both these types the getting in and out of coals and dust is a great difficulty unless there is a back way. In the Midlands it is a common practice in small houses of this kind to make a passage at the side common to two houses for this purpose, and as a tradesmen's entrance.

Larger terrace houses are obtained by placing the drawing-room or a study upstairs and an additional floor of bedrooms. If this is done, great care must be taken with the approach. Most of us can probably call to mind examples where the stair is too narrow, and the bath and water-closet department too conspicuous *en route*. All terrace houses are open to many objections—the difficulty of getting sunshine to all rooms has been mentioned, and the difficulty with coals and dust where there is no basement. To these must be added that the drains, with rare exception, must pass under the building, and the transmission of sound from one house to another is very considerable. Piano playing, singing, the running of children up and down stairs, and even conversation may be heard. As generally planned, the sitting-rooms of different houses have only a thin wall between them, and the front doors of two houses adjoin as at AA. The passage of sound, of course, can be lessened by the arrangement at BB, where the rooms have the staircase between, but the cost is greater, there being more brickwork, and the light and air to the centre part of the house is much damaged. In the London district there is also the æsthetic objection that the party-walls must show above the roofs, and they are very difficult to treat in a satisfactory way. In many of the London districts external walls within 10 ft. of another house have also to have parapets above the roof. These points much affect the design. For example, a series of gables with their ridges over the centre of each house, and parallel to the party-walls, would work out in a most distressing and expensive manner. wide-fronted terrace houses, *i.e.*, those having two rooms on the front, have not been mentioned, as except on plots very shallow from road to back, or with a sharp fall to or from the road where the long type is not easily fitted, they are not much in request. The chief advantage of dwelling in a suburb as against living more in town in a flat or house of equal value lies in having a garden or open space around the dwelling; and the desirability of this and of access to it for a wheelbarrow, &c., make the detached or partially detached house a necessity, and these latter, moreover, get us over many of our previous difficulties.

On narrow plots the semi-detached house is very like the terrace house already described. The front doors can, however, be put at the side away from the party-wall and thus secure greater privacy, but this generally requires a wider plot. These pairs of symmetrically planned houses seem to me to be among the most unsatisfactory designs ever produced. A symmetrical elevation to the road has a great pier instead of opening as the central feature, and this is usually capped by the end of the parapet of the party-wall, which goes up by all sorts of irregular turns so much higher than all the roofs, turrets, dormers, &c., within 4 ft. or so of it. Sooner or later the houses drift into different ownership, and one paints his woodwork white and the other black, and the disaster is complete. The remedy is simple: do not plan a symmetrical pair.

Larger detached and semi-detached houses are so varied in plan they are difficult to classify; a few actual examples were therefore shown on the screen, with some slight comment on each. We give some of the points so far as they are intelligible apart from the illustrations.

Terrace house, 20 ft. frontage; ground falls sharply to rear of plot; drawing-room placed at back on first floor and only ten steps above dining-room at entrance level. Kitchens are thus half-basement so far as levels are concerned, but are themselves entirely above ground. Kitchen gets a good look-out.

Semi-detached house; frontage 40 ft. An attempt to get rid of the usual run of houses in this locality with the door in the middle and a room on either side. Here we have a hall 8 ft. wide, sitting-rooms to the south-east, and both to the front as being the most interesting outlook.

House of 33 ft. frontage, showing ingenious arrangement of the back wing. Scullery, larder, coals, &c., are less in height than the principal rooms, and a sort of mezzanine over them is approached from the half-landing up-staircase.

The mezzanine contains bathroom, water-closet, and a good sized linen-room; these in turn are kept very low, and the servants' bedroom is placed over. This part of the house is, therefore, three floors high against two elsewhere, but the top floor of the wing is only some six steps above the general first floor. This placing of the servants' bedroom would, I think, be generally appreciated both by servant and mistress.

Detached house for corner site; frontage 32 ft.; house entered through a large sitting-room hall. An exceptional appearance is given by placing the main cornice of wood at the level of the first floor window-cills, and above this a Mansard roof, the upper story being thus half in the roof. As the lower slope of the roof commences near the outside edge of the

cornice (top member of which is the rain-water gutter), it is possible to obtain inside a height of 6 ft. before any slope begins, and even then it is 75 deg., the steeper pitch of the Mansard and brickwork being filled in between the rafters. All the external walls are as solid as usual, 6 ft. from the floor.

A corner site house; principal front of about 70 ft. had excellent view across the Avon. Principal sitting-rooms both face this way, and the entrance was from the side road. Attempt made to keep all the water services together, and to so arrange the bath wastes and soil pipes that they do not disfigure the principal fronts.

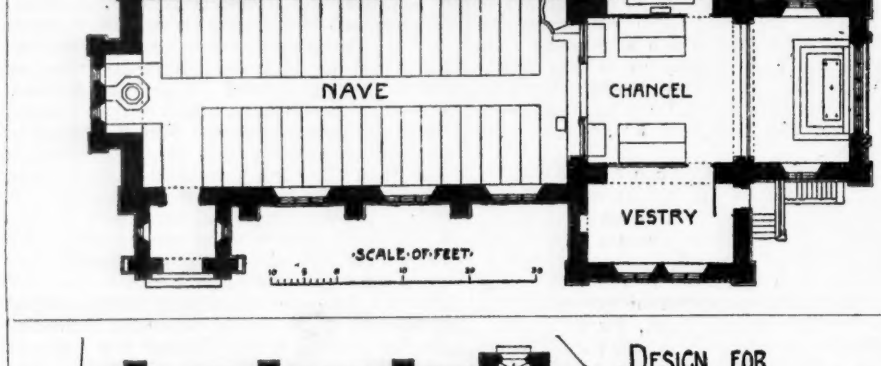
Mr. S. Flint Clarkson said he desired to propose a hearty vote of thanks to Messrs. Searles-Wood and Appelbee for their papers. With much that they had said most people would be in agreement, but there were one or two points to which exception could be taken. He objected to Mr. Searles-Wood's theory of proportions, which he thought was impossible of application. In the case of a middle-sized house, for instance, of from 100*l.* to 120*l.* per year, the relative proportions of a few parts only could be suggested, as some parts must have at least a certain area in the smallest house of the kind. Take a house of the above rental for father and mother, four children, and two servants; if the dining-room were represented as 1 (say about 19 ft. by 15 ft. minimum) the drawing-room might be about 1·2; but the morning-room must be at least 170 superficial feet, the kitchen 210 superficial feet, the scullery at least 95 superficial feet, the pantry at least 80 superficial feet, and the larder at least 60 superficial feet. That was to say, they were not varying to the size of the principal rooms. The principal bedroom might be, in relation to a dining-room of 1, about ·9, but each dressing-room must be at least 80 superficial feet. The second bedroom might be, in relation to a dining-room of 1, about ·8, but each of the bedrooms for the daughters and sons of the household must be at least 170 superficial feet and the servants' bedroom the same, and the bathroom and boxroom each at least 80 superficial feet. There were frequently only four parts which would have the same relative size in several houses; the sizes of the other parts could not be settled by proportion. If this system of proportion could be carried out, buildings would be designed somewhat on the principle that music was ground out by the barrel-organ, the fingers instead of the brains being used. He did not believe in the possibility of this at all, and he thought it was utterly impossible with the varying needs of many kinds of people that this should be done. In reference to the production of pairs of houses, exactly alike, that was partly due to the way towns often came into existence, *i.e.*, by accident. Three people seemed to be responsible for the production and arrangement of suburban towns, viz., the land speculator, the financial agent, and the estate agent. These three personages determined what should be the character of a suburb, and no one else appeared to be approached in the matter. Consequently all manner of shapelessness resulted from the formation of roads in order that more frontage and more money could be obtained. This was a monstrous state of affairs, and some attempt should be made to alter it. He had been greatly impressed by the manner in which Bournemouth had been laid out on the east as compared with the west and the north. The eastern part had been thought out by one whom they all respected, viz., Mr. Benjamin Ferrey, who cut the roads through the pine woods in a rational way, and arranged that buildings should be set back a considerable distance. But across the valley the usual arrangement had been carried out, and there would be found roads going out from the main road and coming back with a loop like a fish-hook, at perhaps a distance of only one hundred yards. As to the duplication of semi-detached houses, the building speculator was chiefly responsible, but architects countenanced him by not showing what might be done. As to the question of three stories, it was an extremely difficult thing, when one came to the practical working out of the problem, to determine how to get the proper bedroom accommodation for the ordinary sized house, but strong objection was taken by many occupants to two flights of stairs. What was needed to overcome the difficulty was a larger ground story. In regard to aspect, nothing was more curiously misapprehended than the question of aspect for the class of houses under discussion. It was said that, although another aspect might be given to the dining-room, probably the best aspect was the north. He disagreed with that altogether, for the dining-room in a large number of cases was also the living room of a family, and they should get as much sun as possible. He held that the right aspect for it was south-east by south. In regard to the height of rooms, he advocated 10 ft. for the ground story, 9 ft. 6 in. for first floor, and 8 ft. 6 in. for the story above.

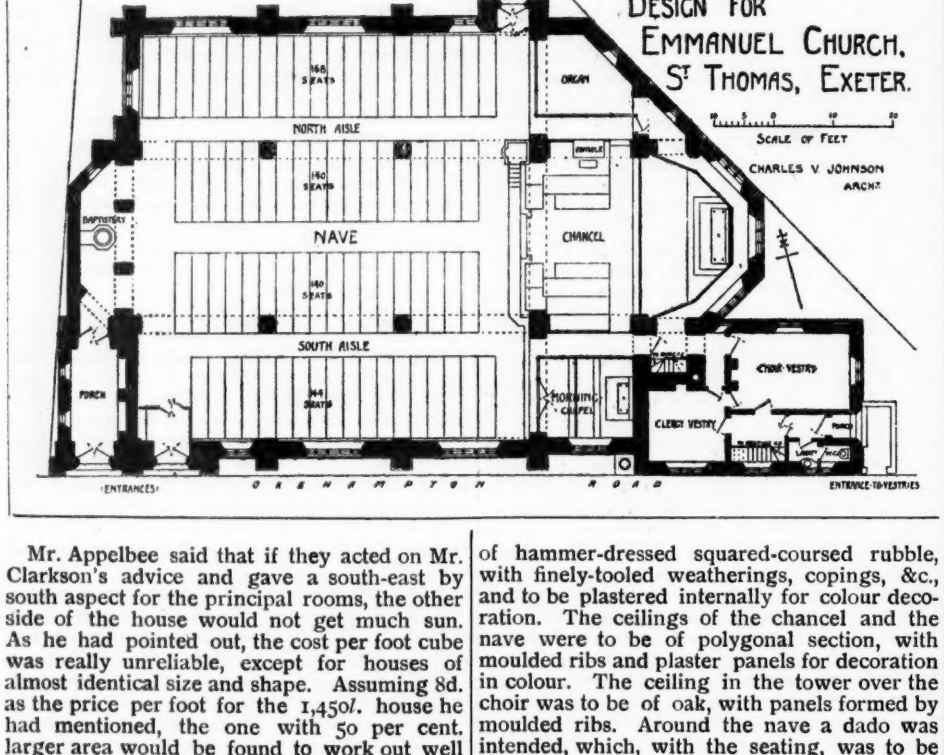
Mr. Henry Lovegrove seconded the vote of thanks and said he did not know how they would define "small," for opinions would differ according to the wealth of owners. The question of the size of drawing-rooms and dining-rooms was often discussed by the ladies of a house; the ladies asked that the drawing-room should be the largest room, for receptions, whereas the master of the house naturally felt that the dining-room was, to middle-class families to a certain extent, not only the dining-room, but the general sitting-room for the family, and he quite agreed with Mr. Clarkson that the best aspect should be chosen for that room. He could not agree with Mr. Searles-Wood about the garden entrance. By all means have the garden entrance if it could be afforded, because people were inclined to come in from the garden without properly wiping their boots, and this in wet weather was very undesirable. The method described by Mr. Searles-Wood of lowering the floor of a billiard-room was a good one, and perhaps the best solution of the difficulty. He quite agreed with Mr. Clarkson as to the height of rooms being 10 ft. for ground floor and 9 ft. 6 in. for first floor, but the question was very much affected by cost, especially now, when bricks and labour cost so much. He would like to ask Mr. Searles-Wood to give them the cost per foot cube of the houses he had referred to. The great drawback to architects designing houses for the middle classes was the cost. An architect might design a house which would cost 1,200*l.*, but in an adjoining street a similar house could be built by the speculative builder for 900*l.* or 1,000*l.* As to the double-hung sash, while the casement was externally very picturesque it was extremely inconvenient, for wet and draught could not be kept out when it opened outside, and when it opened inside it interfered sadly with blinds and curtains. He preferred the double-hung sash, especially as it could be made more or less picturesque by showing nearly all the frame and having very stout sash bars. As to water waste preventers, he knew of a case where they had been a nuisance, but the difficulty had been solved by having a piece of pipe fixed on the inlet pipe so that there was no sound when the water flowed, as the pipe was so near the bottom of the water waste preventer. The best place for the bath and water-closet was over the scullery, for the scullery ceiling was not of much importance if anything went wrong with the upstairs arrangements. They would all agree with Mr. Clarkson in wishing that all houses could be built from architects' designs. Scarcely one house in a thousand in the London district was designed by an architect. Houses were all alike in many streets, and they were run up wholesale, for, unfortunately, if decent houses were erected under contract from architects' designs they could not be made to pay.

The Chairman, in putting the vote of thanks to the meeting, said that the subject was a very important one to the younger members of the Association, for he supposed that nine out of every ten architects began their serious work by designing a small house. The more, therefore, the subject were discussed and studied the better for those just entering upon their careers. The field that was open for invention in the design of small houses was practically unlimited, but at the same time the subject was such a familiar one, that there was great risk, especially with young men, of getting into a groove and thinking that there was no possibility of arriving at any new arrangement. With regard to the smaller terrace house, there was not the least doubt that the plan which put the drawing-room in the back wing and the kitchen looking down the narrow alley was a very great advance upon the more usual arrangement; but at the same time there were disadvantages in it. Mr. Appelbee had shown a plan where there was a small back passage between the two houses which served as a tradesman's entrance; that, of course, meant a serious defect in that type of house. The drawing-room at the back in that class of house generally became a very long narrow room with a window at the end, and it seemed to him that something might be done to improve the proportions of that room. Mr. Searles-Wood had given them some rules as to proportion, but it seemed a mistake to try and lay down hard-and-fast rules on such a matter, because people had different ideas as to proportions, and it was not desirable to get into a groove. Still, it seemed to him that the drawing-room should be a larger room than the dining-room in most houses, because in the dining-room people sat still, while in the drawing-room they more or less moved about, and wanted more room. He thought the billiard-room should hardly ever have a top light in a private house. As had been said, the room was almost always used at night, and if used on odd occasions in the day time the fittings which lighted the table at night cast an objectionable shadow on the table, and it was a mistake to adopt any other arrangement than that of lighting by windows. If the windows were properly arranged, there ought to be no objection to the side light on account of shadow. The vexed question of casements *v.* sashes was one on which there would never be any agreement, he was afraid. It was certainly a matter of taste, to a large extent, but in his opinion there were serious defects in sash windows which, from the artistic point of view, it was impossible to overcome. When one was designing in a more or less picturesque style, one very often wanted to have a long low window, and that was absolutely impossible with a sash. There was also a very radical difficulty in a sash, which could not possibly be got over; and that was that the glass in the upper half of the sash was on a very different plane from the glass in the lower half, and that always seemed to be a very objectionable thing. He knew there were difficulties as to cleaning casements and various points of that sort, but he never came across a casement which could not with a little thought be cleaned from the inside. He supposed that every one would agree that pairs of houses should not be absolutely alike. Generally, when they were designed alike, it was merely an excuse for laziness, because it was an easy matter to get a little variety in the design of the two, although they might be planned exclusively on the same lines. With regard to the height of rooms he differed from what had been said by Mr. Clarkson, for he thought that 10 ft. was rather overdoing it in most cases. He would take as a minimum 8 ft., and there were many rooms which looked better 8 ft. than 10 ft. high. It was easier to treat rooms and decorate them when they were kept to rather low proportions. He supposed that the majority of the members of the Association were familiar with one of the prettiest estates round about London, *i.e.*, Bedford Park estate. A study of the plans of some of the houses on that estate, designed by Mr. Norman Shaw, would well repay the time spent, for there was a great deal of originality shown in the arrangement of them, and they were nearly all planned on the most common sense lines, without extravagance. There was a great deal to be learnt from them, and they showed what could be done in the way of variety.

The vote of thanks having been agreed to,

Mr. Searles Wood, in reply, said he certainly did not mean to suggest by what he had said as to proportion anything in the nature of a stock article; but it seemed to him that it ought to be borne in mind whether or not, in a design, they were to do something original or commonplace. To a certain extent, if they wanted to be reasonable, they ought to design something that would have a value in the market, in view of the fact that the house was likely to change hands. What he wanted to arrive at for the sake of the man in the street was something in regard to the proportions of rooms, like the multiple photographs of celebrities—half a dozen celebrities being photographed on to one another in order to produce a good common type. As to the prices of the houses, the lower one on plate cost 3,000*l.*, and the upper one 1,240*l.* The others were about 2,000*l* each. As to the height of the rooms, it was rather a pretty feature to make a difference in the height of the rooms. As to the vexed question of casements and sashes, he supposed that most architects knew that a hinge could be got which allowed a casement to be reversed, and that got over the difficulty of cleaning.





Mr. Appelbee said that if they acted on Mr. Clarkson's advice and gave a south-east by south aspect for the principal rooms, the other side of the house would not get much sun. As he had pointed out, the cost per foot cube was really unreliable, except for houses of almost identical size and shape. Assuming 8d. as the price per foot for the 1,450*l.* house he had mentioned, the one with 50 per cent. larger area would be found to work out well under 7d. Reference had been made to water waste preventers which made no noise when they filled; but what about emptying? He would like to know of one silent then.

The Chairman announced that the next meeting would be held on April 19, when Mr. M. A. Green would read a paper on "Eighteenth Century Architecture of Bath," illustrated by lantern views.

The meeting then terminated.

Members' Soirée.

Owing to a variety of circumstances, the Committee has decided this year to postpone the soirée and annual play.

Illustrations.

THE GLASGOW EXHIBITION BUILDINGS.

THESE illustrations are reproduced from sketches made specially for this journal by Mr. Alexander M'Gibbon, Glasgow, whose admirable drawings of the Scottish cathedrals, formerly published in a series in our pages, will be remembered by our readers.

The buildings are described and criticised in the first article of this issue, to which the reader is referred.

SMALL SUBURBAN HOUSES.

THESE sketch plans and elevations of small suburban houses formed a portion of the illustrations to Mr. Searles-Wood's paper on the subject read at the Architectural Association, and reported on another page.

TWO DESIGNS FOR CHURCHES.

A COUNTRY CHURCH.

THIS church was designed to seat 260 persons in the nave. The walls were to be built of hammer-dressed squared-coursed rubble, with finely-tooled weatherings, copings, &c., and to be plastered internally for colour decoration. The ceilings of the chancel and the nave were to be of polygonal section, with moulded ribs and plaster panels for decoration in colour. The ceiling in the tower over the choir was to be of oak, with panels formed by moulded ribs. Around the nave a dado was intended, which, with the seating, was to be stained green. The flooring under the seats was to be of pitch pine in narrow widths, and in the gangways, &c., tiled.

DESIGN FOR EMMANUEL CHURCH, EXETER.

THIS design was prepared for and submitted in competition. The requirements were, that the church should seat 600 persons, be capable of being built in sections, and of being easily extended. The design shows a nave with aisles and a chancel, together giving accommodation for 616 persons. A morning chapel and a baptistry are also provided, the latter with a separate approach. Clergy and choir vestries are arranged at the east end of site. In consequence of the low level of the site, special provision was made to exclude flood water. The walls were to be of local red limestone in hammer-dressed squared-coursed rubble, with a 2-in. cavity and an inner 9-in. lining of brickwork. The dressings were to be in Doulting stone, finished with a finely dragged surface. The chequered work at the east end was to be in red limestone and Doulting stone set alternating. The walls were to be plastered internally; the roofs to be open-timbered, ceiled at collar, with moulded ribs to form panels, and externally covered with tiles. The floor to nave was to be of encaustic tiles, the floor of chancel of marble in 6-in. squares. The cost was estimated at 6,000*l.*

C. V. JOHNSON.

THE BUILDING TRADES EXHIBITION.—We are informed that this exhibition, which will open on the 17th inst. at the Royal Agricultural Hall and remain open until the 22nd inst., will be the largest and most representative in point of exhibitors of its kind. Every foot of the ground floor space has been allotted. As already mentioned, special sections are this year being devoted to fire prevention and smoke abatement. Visits to the hall, as in previous years, will be paid by professional institutions interested.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

FORM OF CONDITIONS OF CONTRACT.

THE tenth general meeting of this Institute for the present session was held on Monday last at No. 9, Conduit-street, Mr. E. A. Gruning, Vice-President, presiding.

The minutes of the last meeting having been taken as read, Mr. Alex. Graham, Hon. Secretary, announced the death of Mr. Frederick Boreham, who was elected an Associate in 1871.

The following candidates, recommended for election by the Council, were declared elected:—Mr. Robert Stephen Ayling, Westminster, as Fellow, and Mr. Norman Thorp, Clapham, as Associate.

The Chairman said the next business was to consider the amendments to the Institute form of conditions of contract. As the meeting would be aware, it had been impossible to come to any arrangement with the Institute of Builders on the arbitration clauses which was satisfactory to the members of that body. The Council therefore submitted the amended clauses to the meeting for consideration; afterwards they would be remitted to the Council, so that they could be put in proper form for reprint on the contract as it would be issued in future by the Institute alone.*

Mr. Maurice B. Adams asked whether Clause 32 was the same as before.

The Chairman: Yes, it is exactly the same. Continuing, the chairman said he thought it would be most convenient if they took the discussion on the clauses *seriatim*, taking Clause 1 first.

Mr. E. T. Hall said he would move the acceptance of the amended Clause 1:—

"1. That the works shall be carried out in accordance with the directions, and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. If the work shown on any such further drawings or details, or necessary to comply with any such instructions, directions, or explanations, be, in the opinion of the contractor, in excess of that comprised in the contract, he shall, before proceeding with such work, give notice in writing to this effect to the architect. In the event of the architect and contractor failing to agree as to whether or not there is any excess, and of the architect deciding that the contractor is to carry out the said work, the contractor shall accordingly do so, and the question whether or not there is any excess, and if so the amount thereof, shall, failing agreement, be settled by the arbitrator as provided in Clause 32, and the contractor shall be paid accordingly. The contract drawings and specification shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor."

If carefully studied the clause would be seen to be identical with the previous one, excepting that the latter part, which was the concluding part of the old Clause 12, had been transferred to No. 1, simply because in sequence it came better there than in Clause 12, which dealt with variations. It was practically no change from the present form of conditions.

Mr. Adams said he would be very pleased to second the motion. He thought it would be useful to them if they ascertained why these amendments were put forward, for it was distinctly stated that the Council did not propose them.

The Chairman said a special meeting of the Council was appointed to see the builders to ascertain whether they could not agree upon a joint form of contract. During the discussion it was found that a great many of the clauses would be better amended than altered, and having gone through that amount of work the Council thought they might as well utilise the labours of the committee by putting them before the Institute, and that was how the amended clauses arose. It was proposed to adopt the clauses so far as regarded their sense, but it was not necessary to accept them verbally. That would apply to all the clauses that might be accepted or rejected afterwards.

The clause was then agreed to.

Mr. Hall said he would move Clause 12.

"12. The contractor shall, when authorised by the architect, or as provided by Clause 5, vary by way of extra or omission from the drawings or specification; such authorisation is to be sufficiently proved by any writing or drawing given by the

* In our issue for December 8 last we printed the original clauses and the clauses as amended.

architect, or by any subsequent written approval by him. No claim for an extra shall be allowed unless it shall have been executed under the provisions of Clause 5, or by the authority of the architect as herein mentioned. Any such extra is hereinafter referred to as an authorised extra.

The alteration there was this: Under the old Clause 12 it said "the contractor shall not vary from the drawings except by the authority of the architect." One or two solicitors to members of the Institute had drawn attention to the fact that there was nothing in the contract which said that the builders should vary by order of the architect, and it had been said that it was quite possible a builder might refuse to vary at all and that there was no power given to them to compel him to vary. Therefore, instead of it being put in in a negative form, it now read that the contractor shall vary. So far as he knew, that was the only difference in Clause 12 and the old Clause 12. As he had already explained, the latter part of the old Clause 12 had gone into the new Clause 1.

Mr. H. Hardwicke Langston seconded the acceptance of the clause.

Mr. Brodie said that, on behalf of the Contracts Committee—more or less unofficially because the amended clauses had been issued since the last meeting of his committee took place—he had a slight addition to propose to the clause. Mr. Hall was quite right in saying that attention had been called to the fact that in the old conditions there was no power given to the architect to compel the carrying out by the builder of extra works. An actual case was brought before his committee, and they reported on it to the Council, and he was glad to see that an alteration in the direction they wished had been proposed. But he did not think it went quite far enough because it only said "that the contractor shall *when* authorised," and he would propose that the words "instructed or" be inserted there so that the clause should read, "the contractor shall when instructed or authorised by the architect," and that would necessitate the insertion of the words "instruction or" in front of the word "authorisation" where it occurred in the first part of the clause.

Mr. Hall asked what was the difference between "instruction" and "authorise."

Mr. Brodie said a client might give an order which the architect might authorise, because the architect would instruct off his own bat.

Mr. T. E. Collcutt said it seemed to him that the clause as it stood provided for everything they wanted.

The amendment not being seconded, it fell to the ground, and the amended clause was accepted.

Mr. Hall moved Clause 17 as amended, viz.:—

"17. Any defects, shrinkage, or other faults which may appear within months from the completion of the works, arising in the opinion of the architect from materials or workmanship not in accordance with the drawings and specification or the instructions of the architect, or any damage to pointing by frost appearing within the like period, shall upon the directions in writing of the architect, and within such reasonable time as shall be specified therein, be amended and made good by the contractor at his own cost, unless the architect shall decide that he ought to be paid for the same; and in case of default the employer may employ and pay other persons to amend and make good such defects, shrinkage, or other faults or damage, and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the employer, or may be deducted by him from any moneys due or that may become due to the contractor. Should any defective work have been done or material supplied by any sub-contractor employed on the works who has been nominated or approved by the architect, the contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the contractor, and been subject to the provisions of this and the preceding clause."

The only change arose in this way. The old clause read "Should any defective work have been done or material supplied by any sub-contractor or other person employed on the works." The objection the builders raised to this was this. Supposing the employer brought upon the works a sub-contractor with whom the head contractor had no relation whatever, it was not just that he (the head contractor) should be responsible for anything done by the sub-contractor. They felt that was a perfectly just objection and, therefore, the words "or other person" were omitted. It, therefore, in effect meant that if any defective work was done by the chief contractor or any of his sub-contractors—the persons mentioned in the specification—he was to be responsible, but he was not to be responsible if it was done by a person with whom he had no relation whatever.

Mr. Slater seconded the motion.

Mr. Langston said he considered the contractor was placed in a wrong position by the clause. The contractor was made to be liable for the failings of servants not his own.

The Chairman: No; you are mistaken. It is the very object of the amended clause to prevent that.

Mr. Langston: It says, "Should any defective work be done or material supplied by any sub-contractor employed on the works who had been nominated or approved by the architect, the contractor shall be liable." He did not wish to exclude the contractor from his responsibility, but he thought if a contractor was to be liable for work he had not done, as that clause would make him, he ought at least to be a consenting party to the nomination and approval by the architect.

The Chairman pointed out that this was in Clause 20.

Mr. Langston said Clause 20 read, "Who may at any time be nominated, selected, or approved by the architect." That, he contended, was simply forcing a condition on the contractor without the contractor being really a party to the condition.

Mr. Hall remarked that Mr. Langston did not read enough of Clause 20, or he would see that his objection was met.

Mr. Langston said Clause 20 went on to say that no such sub-contractor should be employed against whom the contractor should make what the architect considered a reasonable objection. But it all came to this—Unless they made the contractor a consenting party to the appointment of the nomination of the architect, the words in the clause were not good in English law. The amendment he wished to suggest was that Clause 17 should be linked in some way with Clause 20, and that the contractor should be an approving party of the nomination. The contractor should not have the sub-contractor forced upon him. When the question was before them the last time he remembered some remarks of the chairman to the effect that the contractor, having received or arranged for a profit from the sub-contractor's work, he was then held to be liable as getting such a profit. But there were lots of cases where the contractor did not carry any profit into his tender from such work.

The Chairman: If he does not, that is his own fault.

Mr. Langston said he was aware of that, but he put it to them as practical men, whether it was really not outside common sense for any one individual to be answerable for the faults of the servants of another individual unless he was a consenting party thereto. He was of opinion that it did not in Clause 20 make it emphatic that the contractor was a consenting party. The clause certainly did not want much altering. He would suggest that the words, "With the consent of the contractor," should be inserted in Clause 17, after the sentence, "nominated or approved by the architect."

The Chairman observed that it appeared to him that was provided for in Clause 20. That clause said that no sub-contractor should be employed on the works against whom the contractor should make what the architect considered a reasonable objection. He considered that that perfectly covered the contractor's liability.

Mr. Langston said that in the case of a firm supplying the iron or steel work, or the decoration or plumbing work, what trouble he would have if things went wrong. They had to write to the contractor and the contractor then wrote to the sub-contractor, and nothing was rectified until the clerks got into communication.

The Chairman said that if Mr. Langston would give him his amendment he would put it to the meeting.

Mr. Langston moved that the words "such nomination or approval being consented to by the contractor" be inserted in the clause after the words "approved by the architect."

Mr. E. W. Hudson seconded the amendment.

Mr. Hall said Mr. Langston was talking as if the contractor was asked to be responsible for the work of other persons, but the whole essence of his condition of contract was that the contractor was responsible for everything in the building. He might have sub-contractors under him, but there was no priorty of contract between the employer and sub-contractor. The contract was between the employer and the contractor; it was only ministerially that the architect appointed or suggested or nominated a sub-contractor. The builders had agreed to this, and it would be a most dangerous thing to alter. In fact, if Mr. Langston's suggestion were carried the builder could, if he thought fit, stop the whole contract by refusing to consent to the appointment of a sub-contractor. Let them look what that meant if they had a cantankerous builder, who would simply say, "I will not accept this nomination." If he did that, where were they? The contractor would then accept no liability at all, although he was being paid by the employer to deliver up the building complete within a given time.

Mr. Slater suggested that the whole of the objection of Mr. Langston would be met if they put after the words "approved by the architect," the additional words "subject to Clause 20."

Mr. Brodie thought that if the builders had agreed to the clause they were quite capable of looking after themselves.

Mr. Langston considered it a case where builders required to be protected against themselves.

The Chairman: I do not think there is any need for that at all.

Mr. Langston agreed that the words suggested by Mr. Slater would meet the case, and he was willing to accept them, for he was certain that if the clause remained as it was printed, it would be a continual bone of contention. The builders might have agreed to it—possibly their solicitors had so advised them, seeing that it was a hole made for a quarrel.

Eventually it was agreed that the words "as provided in Clause 20" be inserted after the words "or approved by the architect."

The clause as thus amended was agreed to.

Mr. Hall moved the adoption of the amended Clause 20, as follows:—

"20.—All specialists, merchants, tradesmen, or others executing any work, or supplying any goods for which prime cost prices or provisional sums are included in the specification, who may at any time be nominated, selected, or approved by the architect, are hereby declared to be sub-contractors employed by the contractor; but no such sub-contractor shall be employed upon the works against whom the contractor shall make what the architect considers reasonable objection, or who will not enter into a contract with the contractor upon terms and conditions consistent with those in this contract, and securing the due performance and maintenance of the work supplied or executed by such sub-contractor, and indemnifying the contractor against any claims arising out of the misuse, by the sub-contractor or his workmen, of any scaffold erected or plant employed by the contractor, or that may be made against the contractor in consequence of any act, omission, or default of the sub-contractor, his servants or agents, and against any liability under the Workmen's Compensation Act, 1897, or any amendment thereof."

He remarked that the change was radical, but he considered very essential. Unfortunately, he had been professionally engaged in a very heavy lawsuit, and the clause was the outcome of that. The point involved was this: in a large contract of his the builder had, on the advice solely of his legal adviser—there was no dispute before the end of the contract—raised the point of getting damages. The builder took the point that any sub-contractor nominated or approved by the architect, *ipso facto* became the contractor of the employer, and that the builder was absolutely relieved of any responsibility for anything he did; and not only that, but if the sub-contractor caused delay, the employer was liable in damages to the builder for the delay caused, and in the case he had referred to the builder claimed 12,000*l.* for delays by the nominated sub-contractor. In the Division Court he (Mr. Hall) had won the case, and they were now awaiting the decision of the Appeal Court. It was to avoid such a contingency again that the clause was amended, and the Builders' Council had agreed to the alterations. It was contended before the Council of the Builders' Institute that what the amended clause provided was the practice, and the builders assented to that, and therefore the words had been introduced. He considered it most important that the alteration should be made.

Mr. Hudson seconded the motion, and it was carried.

Mr. Slater said he would move the amended Clause 21, which simply brought in the Workmen's Compensation Act. Clause 21 was :—

"21. The contractor shall be responsible for all structural and decorative damage to property, and for injury caused by the works or workmen to persons, animals, or things, and shall hold the employer harmless in respect thereof, and also in respect of any claim made under the Workmen's Compensation Act, 1897, or any amendment thereof, by any person in the employ of the contractor. He shall also be responsible for all injuries caused to the buildings, the subject of this contract, by frost or other inclemency of weather, and shall reinstate all damage caused by the same, and thoroughly complete the whole of the works."

Mr. Adams seconded the motion, and asked whether it might not be well to make the contractor responsible for deficient watching. Of course the contractor put down something for watching, but naturally wanted to minimise things under that head. At the same time many things got damaged by persons intruding on to the premises. He suggested whether perhaps it might not be well to have the words "efficient watching" introduced, although he did not know but what such a contingency was already covered by the form of contract.

The Chairman thought that was rather a matter to be put in the specification.

The amended clause was then carried.

Mr. Hall proposed the adoption of amended Clause 28, viz. :—

"28. The provisional sums mentioned in the specification for materials to be supplied or for work to be performed by special artists or tradesmen, or for other works or fittings to the building, shall be paid and expended at such times and in such amounts and to and in favour of such persons as the architect shall direct, and sums so expended shall be payable by the contractor without discount or deduction, or (without prejudice to any rights of the contractor existing under the contract referred to in Clause No. 20) by the employer to the said artists or tradesmen. The value of works which are executed by the contractor in respect of provisional sums, or in additional works, shall be ascertained as provided by Clause 13. At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen, and the said value of such works executed by the contractor, shall be set against all such provisional sums or any sum provided for additional works, and the balance, after allowing *pro rata* for the contractor's profits at the rates contained in the contractor's original estimate, shall be added to or deducted from the contract sum, provided that, in estimating the amounts paid as last herein provided, no deductions shall be made by or on behalf of the employer in respect of any damages paid by the sub-contractor to the contractor, the intention being that the contractor and not the employer shall have the benefit of any such damages."

In the old clause it said : "At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen," &c. Supposing a contractor entered into a sub-contract and made the sub-contractor liable in damages to him for any breach or undue delay, as the clause was contained in the old form, the employer, and not the contractor, got the benefit of that. But that was not their intention. Their intention was that under such a sub-contract the damages should be paid to, and become the property of, the contractor, and they had endeavoured to give effect to that now. In the old clause, unfortunately, the wording was such that the damages went to benefit the employer. He was not giving his own opinion, but the opinion of judges, and therefore they had endeavoured to correct what was a great hardship to the builder, and a hardship which they—the architects—never intended. The builders had agreed to the change, as it was manifestly in their interests to do so.

Mr. Slater seconded the motion, and it was carried.

Mr. Hall moved Clause 29 as amended, viz. :—

"29. The contractor shall permit the execution of work by any other artists or tradesmen who may be engaged by the employer."

There was a difference, he said, from the old clause which they should very carefully note. In the old form it stated that the contractor should, unless otherwise stated in the specification, provide and erect all necessary scaffolding and plant for the due execution by the artists and tradesmen referred to in the preceding clause of the work entrusted to them. That was now omitted from the clause, for it was held that that was a matter which should go into the specification. Personally, he thought it would have been better in the clause, but still that was not before them. As long as they did not forget to put it into the specification it would be all right.

Replying to a question by Mr. Adams, the chairman pointed out that if the old clause stood in the contract, how was the builder to estimate the amount of scaffolding to be put up for the sub-contractor of whose work he knew nothing. It was far better that any scaffolding provided for special purposes should be described in the specification than by a general item in the contract.

Mr. Adams then seconded the proposition.

Mr. Langston asked if the clause was quite clear. For instance, in the event of the interior being filled up with scaffolding and plant, the architect could permit either artists or tradesmen to go over it.

The Chairman said that really was a matter which must be dealt with in the specification. It was impossible to specify those things in general terms in a clause of the contract.

The proposition was then agreed to.

Mr. G. F. Fellowes Prynne moved the rejection of the amended Clause 32, and this was seconded by Mr. Adams and agreed to.

Mr. Prynne then moved the adoption of the old clause, with the figure "16" inserted between "9 and 16," so that the clause should read as follows :—

"32.—Provided always that in case any dispute or difference shall arise between the employer or the architect on his behalf and the contractor, either during the progress of the works or after the determination, abandonment, or breach of the contract, as to the construction of the contract or as to any matter or thing arising thereunder (except as to the matters left to the sole discretion of the architect under Clauses 4, 9, 16, and 19, and the exercise by him under Clause 18 of the right to have any work opened up), or as to the withholding by the architect of any certificate to which the contractors may claim to be entitled, then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of

or, in the event of his death or unwillingness or inability to act, of

, or, in the event of his death or unwillingness or inability to act, of a person to be appointed on the request of either party by the president for the time being of the Royal Institute of British Architects, and the award of such arbitrator shall be final and binding on the parties. Such reference, except on the question of certificate, shall not be opened until after the completion or alleged completion of the works, unless with the written consent of the employer or architect and the contractor. The arbitrator shall have power to open up, review, and revise any certificate, opinion, decision, requisition, or notice, save in regard to the said matters expressly excepted above, and to determine all matters in dispute which shall be submitted to him, and of which notice shall have been given as aforesaid, in the same manner as if no such certificate, opinion, decision, requisition, or notice had been given. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act, 1889."

He considered that the suggestion in the amended clause which made it possible for the contractor to call for an arbitration was a most dangerous thing. The architect was often now placed in a difficult position, and what would it be if the builder at any time was dissatisfied and could call for an arbitration in the middle of the work? Then again the architect's position would be entirely undermined. Say that an architect condemned a certain amount of timber, and the builder then and there demanded an arbitration! It was extremely difficult in the country to get an arbitrator down at a moment's notice to arbitrate on the timber, and it would cause certain delay; but, besides that, the arbitrator might have a certain difference of opinion as to the material which the architect was using or condemned, and the arbitration might go against the architect, however experienced he might be. In that case the position of the architect would be entirely weakened in the eyes of his client. A man might be an excellent arbitrator, but he might not be a judge of material in the same way as an experienced architect would judge. Another point was that the builders would accept any condition they put in if the architects would accept this point, for the one aim of the builders was to get an arbitration on materials. But, on the other hand, the present power of the architect was practically the only power he possessed under the contract. It had been said that there were architects who condemned viciously, but he thought they were very few and far between, and they as an Institute could not provide a contract which would satisfy the requirements of men who were thoroughly inexperienced or vicious in character. Their idea was to keep that which they believed to be fair for men thoroughly experienced in their professional work, and they could not undertake to draw up conditions for those who were incompetent or vicious.

At the request of Mr. Hall, the Clause 16, giving the architect power to condemn material, was read.

Mr. Hudson remarked that that certainly ought to be included.

Mr. Hall said the admission of the reference to Clause 16 in the Clause 32 would involve some alteration in Clause 16. At the end of Clause 16 it said: "And in respect of all matters hereunder the architect's decision shall be final."

The Chairman said that was very possible, but in need not be discussed now, as it would come up again.

The clause as amended was then adopted.

Mr. Pryce Cuxson said he would like to suggest an amendment in Clause 13 in regard to that portion which provided that "a copy of such measurements and valuation shall be given to the contractor." Those words had frequently cropped up in his practice as a surveyor, and they had sometimes been attempted to be construed to mean that the contractor had power to call upon the surveyor to furnish a copy of his dimensions. He did not believe that those who framed the clause had any such intention, but yet when read very carefully it was quite capable of that interpretation. Moreover, he believed he was correct in saying that it was not the usual practice for quantity surveyors in London to supply contractors with a copy of the variation account unless they paid the cost of copying such bill.

The Chairman said he must stop the discussion of that matter, which was simply a question of practice between surveyors and builders.

Mr. Hall said he believed that Mr. Pryce Cuxson wished to suggest that the words should be "a copy of the bill" instead of a copy of the measurements.

Mr. Brodie said he would strongly support the suggestion of Mr. Pryce Cuxson that the words should read "and a copy of the bill of such measurement and valuation be given to the contractor," because that was what they meant.

Mr. Pryce Cuxson said he also wanted to add the words after contractor "prepared by him."

The Chairman said he could not accept the addition because he did not think they had any power to deal with the quantity surveyor and the builder.

Mr. Adams said he thought if they put quantity surveyors down, they should put down what they should do. He had had precisely the same difficulty brought before him.

The Chairman: I have no objection to your saying what they shall do, but I have an objection to your saying anything about the payments between the builder and quantity surveyor; therefore he refused to put the amendment in the form in which Mr. Pryce Cuxson had moved it.

Mr. Slater said he did not think there could be the slightest objection to altering the words so that it should read "a bill or statement," and if that would be an improvement in the contract by all means let them have it.

Mr. Hall said that after all was said and done they were imposing something on the surveyor by the clause. They were saying that under the contract he was bound to supply and, of course, in that contract it meant bound without payment. He thought the words "bill or statement" met the difficulty.

The Chairman: I have no objection whatever to take that.

After some further discussion the clause was amended so as to read: "and a copy of bill or statement and valuation shall be given to the contractor."

The Chairman announced that the Council would bring up an amended draft at a special meeting to be held on the 15th inst. He

urther announced that at that special general meeting a recommendation would be considered from the Council that Mr. W. Emerson, President, be requested to allow himself to be nominated as President for the ensuing year of office, and that, consequently, By-law 26 be suspended. He further announced that the next ordinary general meeting of the Institute would be held on Monday, April 22, when Mr. Francis Bond would read a paper on "The Classification of Romanesque and Gothic Architecture."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE eighth meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on the 22nd ult., Mr. C. H. Strange, Chairman of the section, in the chair. The paper of the evening was entitled, "Lincoln Cathedral," and was by Mr. L. Stanley Crosbie.

Mr. Crosbie introduced his subject by a brief examination of the causes, geographical and historical, which led to the foundation of the city and the See, tracing the course of events from the mission of St. Paulinus to the establishment of the See of Sidnacester, the ancient cathedral of which yet stands in the village of Stow, ten miles to the north-west of Lincoln, following on with the account of the removal of the bishopstool to Dorchester-on-Thames, and then the final foundation of the cathedral and See in Lincoln city by Remigius, the follower of the Norman King, in about 1076. He then gave a short sketch of the evolution of the cathedral, the accidents of war, fire, and earthquake, which caused the wreck of the Norman structure of the first foundation, and then of the second foundation by St. Hugh on the plesent plan and scale, leaving but the west front of the Norman. After summing up the historical section of his paper, Mr. Crosbie proceeded to deal with the more salient points of the structure which would appear to challenge criticism or excite special interest, claiming to regard the Minster in the light of an architectural whole} rather than dealing with the archæological examination of parts. The peculiar beauties of the views and glimpses of the cathedral, both as seen in the near as also in the far distance, and the magnificent share the hill and the contour of the surrounding country has in the fame of the Minster, were enlarged upon, while at closer quarters the unique west front was criticised in some detail. The author of the paper gave it as his opinion that while the defects of this much abused front were obvious, and should not be overlooked, there was yet so much thought and interest, so vivid a page of history and human effort displayed here, that the balance of worth was entirely in its favour, even putting on one side for the moment its great breadth of effect and impressive grandeur.

With the aid of photographs and some sketches Mr. Crosbie went on to point out the fine grouping at the east end, the elaborate and beautiful "Bishop's Door," the Galilee porch, the transept gables with their famous circular windows, the "Bishop's Eye," and the "Dean's Eye." He also drew attention to the excellent late Norman work in the western towers and portals, and after alluding to several items of lesser interest in the external architecture, proceeded to describe the interior, quoting the words of Mr. Penrose, describing the exquisite proportions of the nave, and drawing attention to the comparative smallness of the nave piers, producing so noticeable an effect of lightness and grace. The splendid choir stalls and the far famed angel-choir also received attention. He spoke of the few fine examples of thirteenth century glass yet remaining in the cathedral, and deplored the existence and retention of the ugly glass which forms so serious a disfigurement to the glorious east window. Mr. Crosbie then gave some description of the cloisters, and defended them from the charge of paucity and meanness so often brought against them on the ground that, though undoubtedly small, this was largely atoned for by the suitable proportions of the bays, as compared with the area of the cloister garth, and the additional greatness of scale which accrued to the Minster by way of comparison. A few descriptive passages with regard to the close and the surrounding buildings, notably the palace, the precentory, and the chancery, concluded the paper.

Mr. R. H. Weymouth opened the discussion and proposed a vote of thanks to the author for his paper. Mr. W. H. Seth Smith seconded, and the discussion was continued by Messrs. H. J. Leaning, A. S. Tayler, R. W. Mulready, G. R. C. Harding, C. H. Strange, and W. B. Hopkins.

COMPETITIONS.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.—The plans selected for the new municipal buildings in South Shields were prepared by Mr. Ernest E. Fetch, A.R.I.B.A., 20, John-street, Adelphi, London, W.C.

ADDITIONS TO POLICE COURTS, BRISTOL.—Out of the seventeen sets of drawings sent in competition for the proposed alterations and additions to the Police Courts, Bristol, the designs premiated are those respectively of Mr. Henry Williams, architect, Clare-street, Bristol; and Messrs. Buckland & Farmer, architects, Paradise-street, Birmingham.

ARCHÆOLOGICAL SOCIETIES.

SURREY ARCHÆOLOGICAL SOCIETY. — The forty-sixth annual meeting of this Society was held on Saturday, March 23rd, at the Castle Arch, Guildford, Surrey, to receive the report and balance-sheet of the Council. Viscount Midleton, the President of the Society, occupied the chair, and moved the adoption of the report and statement of accounts of the Society. In fulfilment of the promise made in last year's report, a complete and bound volume of the Society's collections (Vol. XV.) was duly issued to all members not in arrear with their subscriptions. In this volume are valuable papers by Mr. J. Lewis André, Mr. H. E. Malden, M.A., Mr. Mill Stephenson, the Rev. T. S. Cooper, Mr. A. Ridley Bax, Mr. Philip M. Johnston, and Mr. Cecil T. Davis. The catalogue of church plate is, with the exception of certain appendices, now brought to its conclusion by Mr. Cooper. The Council, while it congratulates the members on this evidence of the Society's increased prosperity, and is decided to repeat this policy of issuing a complete volume for the year during the present year, feels that, if the practice is to become permanent, it must still further urgently appeal to them to enlist the interest of their friends in the Society's work, and thus help to obtain new members. Considerable as has been the increase in the number of members during the past two or three years, the Council is persuaded that this number does not yet adequately represent the number of those who are interested in the archæology of the county. The excavations at Waverley Abbey were continued last summer, under the superintendence of the Rev. T. S. Cooper and Mr. Henry Horncastle, with even more important and satisfactory results than hitherto. Mr. Harold Brakspear has given much valuable time and experience to bear on doubtful and difficult points. The work has been at times very perplexing, owing to the many and unexpected walls and footings found of the Norman abbey mixed up with and sometimes made use of in the later buildings. In the previous year Mr. Brakspear discovered the little presbytery of the Norman church in and forming part of the south transept of the later church planned by William de Bradewater. The long, narrow Norman nave has now been traced below the cloister. The original cloister was at some time considerably enlarged and carried across the cellarium as well as the nave of the first church. The arrangement of the Frater and its pulpit is interesting, as it shows the former to be of two dates at least. The plan of the infirmary hall and kitchen is now clear, and it has become evident that there was no building between this portion of the abbey and the river. Some very interesting features, too, have come to light in the direction of the monks' dormitory. Much of the Norman work here remains, with the south wall on a line with that of the Frater; later the dormitory was extended southwards at a higher level almost to the river bank. At the north end the doorway leading from the cloister and the fine broad steps ascending to the dormitory have been exposed, and close by a winding staircase which probably formed the approach to the treasury. The plan of Bradewater's church also is now nearly complete. There is still a good deal to be done west of the cellarium, where the guest-houses, the infirmary of the conversi, and possibly a gateway may be looked for. This is of almost greater importance than the work already done, since these buildings of the outer court have never been worked out properly anywhere. Both at Fountains and Furness the remains of them are anything but complete, and at the former it is known there were a number of buildings of which no trace can be found. The Society has therefore the opportunity of adding materially to what is already known of the plan of a Cistercian abbey, an opportunity which may not present itself again. It is much to be hoped that the owner of the site will allow the excavations to be extended. In the event of his doing so, the Council must again appeal for subscriptions to carry to a satisfactory conclusion that which is undoubtedly the most important work the Society has ever taken in hand. Mr. George Martineau has resigned his seat on the Council, and Mr. Frank B. Eastwood, of High Clandon, has been duly elected to fill the vacancy. The Council has also appointed Mr. Thomas Howse, F.L.S., to act as hon. librarian of the Society. The number of members is 383: viz., annual, 289; life, 93; honorary, 1. During the year 27 new members have been elected: viz., annual, 26; and life, 1. By death the Society has lost 8 members: viz., 5 annual and 3 life. By resignation: 4 members. Mr. More-Molyneux seconded the motion, and the report and balance-sheet were adopted unanimously. On the motion of Mr. Garraway Rice, Messrs. F. A. Crisp, F. B. Eastwood, Edwin Freshfield, W. More-Molyneux, Ralph Nevill, Sir F. Pollock, Bart., Colonel John Davis, and Lieut.-Colonel W. Marsden were re-elected members of the Council. Viscount Midleton moved the re-election of Mr. M. S. Giuseppi as hon. secretary, with a vote of thanks for his services during the past year, which was adopted. The auditors, Messrs. W. F. Potter and Cecil T. Davis, and the hon. librarian, Mr. T. Howse, were also unanimously re-elected. The meeting closed with a vote of thanks to Lord Midleton for presiding.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening last, Mr. Charles Mason, President, in the chair, a paper was read on "The Production of Metallic Bars and Tubes under Pressure," by Mr. Perry F. Nursey, Past President, who stated that his purpose was to describe the various processes and apparatus employed in the manufacture of bars and tubes by forcing metal through dies by pressure. The primary application of this principle, he observed, was to the manufacture of lead pipes; but before describing the methods of their production he referred to some water-pipes made by the Romans which he inspected at Bath some years since during some excavations in the Roman baths there. They measured about 18 in. wide by 4 in. deep, and were made from a dished strip of lead which constituted the top, whilst a flat strip, having its edges turned up over the edges of the upper strip, formed the bottom. He then referred to the early manufacture of lead pipes, which were made by either drawing or rolling cylinders of lead down to the required diameter on a mandrel which formed the bore. Lead pipes were also made by bending sheet lead over a mandrel and soldering the edges. These unsatisfactory methods were in time superseded by the lead pipe press, in which molten lead is placed in a heated container, and when cooled down to plasticity is forced through a die by hydraulic pressure. By this means, instead of only short lengths of pipes being made, as with the old methods, pipes of any required length are produced. The author described the process of manufacture as he had witnessed it at the Farringdon Works of Messrs. Pontifex, in Shoe-lane, London. He then described the improved lead pipe press of Mr. Alexander Wylie, as made by Messrs. Wilson & Sons, of Johnstone, Glasgow, which is a considerable advance upon the ordinary lead pipe press. In the later examples, instead of the container being kept hot by a fire or a ring of gas jets it is jacketed and steam-heated. An important adaptation by Mr. Wylie of this press to the encasing of telegraph cables in lead pipes was next described. Before this press was devised the cable used to be attached

to the core of the pipe-press, and the pipe as produced pushed forwards over it. This method had several drawbacks, the most serious of which was damage to the cable by heat. This was remedied to some extent by passing the pipe through cold water before it reached the cable, but this was insufficient to produce a good result. Another method employed was to make the pipe and draw the cable into it. In Mr. Wylie's press the cable passes horizontally through a core, the process of covering being rapid, continuous, and effective. Turning next to the extrusion process of Mr. Alexander Dick, the inventor of Delta metal, the author stated that by its means all kinds of bars from a simple round wire to complex sections, which it was impossible to roll, and also tubes of any section, were produced by causing metal heated to plasticity to flow through a die under hydraulic pressure. Considerable difficulty had been encountered by Mr. Dick in designing the apparatus in which a metal offering a far higher resistance than lead, and pressed at a far higher temperature than that metal, had to be dealt with. Lead, with its melting point of 620 deg. Fahr., is pressed out at a comparatively low temperature and pressure, whilst in Mr. Dick's process copper and its alloys—far less ductile metals than lead—with their melting points of about 2,000 deg. Fahr., are operated upon at a very high temperature, namely that of plasticity, or about 1,000 deg. Fahr. Mr. Dick's method consists in charging the hot metal into a horizontal container, at the front end of which is the die. Upon hydraulic pressure being applied at the rear end of the container the plastic metal is forced through the die, issuing therefrom either as bars or tubes. The author stated that he had inspected Mr. Dick's highly ingenious apparatus in operation at the Delta Metal Works, Pomeroy-street, New Cross, London, where he had seen it produce both bars and tubes. An important feature in the bars thus produced is that the quality of the metal is greatly improved. It acquires increased density, and is perfectly homogeneous, extruded bars of a given metal giving higher results when tested for tensile strength than rolled bars of the same metal, whilst it works best in the lathe or the screwing machine at speeds twice, and even three times, as great as those employed with ordinary metal. This was shown by the remarkable results of tests made for the author by Alfred Herbert, Limited, of Coventry, in one of their Hexagon Turret lathes.—The paper was well illustrated by drawings of the various machines described, and by specimens of extruded metallic bars and tubes, and the various turned and screwed test pieces.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 3,615*l.* for building and paving works; Stepney Borough Council, 10,000*l.* for electric light installation; and the Hampstead Borough Council, 4,385*l.* for a dust destructor.

Standing Orders—Contracts.—The General Purposes Committee brought np a report containing the following paragraph :—

"The Council on February 19 last referred it to us to consider and report as to the advisability of amending the standing orders as to contracts in order to provide that the trades to be employed in the more important sections of any works to be carried out under contract should be specified in a schedule to be added to the contract.

The question was raised by the Asylums Committee, and in their report they stated that difficulty had arisen at the Horton Asylum in consequence of the casing and capping in connexion with the electric light installation being fixed by wiremen, the Amalgamated Society of Carpenters and Joiners claiming that the work should be done by carpenters. The Asylums Committee stated that they had asked the contractors to employ carpenters for this work, but that in the absence of any stipulation in their contract they had declined to do so, and that the Committee were unable to insist upon the contractors complying with their request. To meet similar cases in future, the Committee accordingly made the suggestion that in future it would be well to specify in contracts the trades to be employed in the more important sections of the work for the carrying out of which the contract was entered into. Having carefully considered the question, we are of opinion that it would be inexpedient to amend the standing orders in the direction referred to. We recommend that the Council do concur in this view."

It was moved by Mr. Dew, seconded by Mr. Taylor, that the paragraph be referred back. After a brief discussion, the amendment was defeated, and the Committee's recommendation was carried.

The Housing Question—Lordship-lane Estate, Tottenham.—A long debate then took place on the following recommendations of the Housing of the Working Classes Committee :—

"(*a*) That the estimate of 91,500*l.* submitted by the Finance Committee be approved; and that the Council do acquire, under Part III. of the Housing of the Working Classes Act, 1890, and the Housing of the Working Classes Act, 1900, about 225 acres of land at Tottenham, Wood Green, and Edmonton, known as the Lordship-lane estate, at 400*l.* per acre, subject to the Council accepting the areas appearing on the ordnance survey, paying vendors' surveyors' fee, and all expenses of sale and purchase, and taking the land subject to existing tenancies and tithe.

(*b*) That the solicitor be instructed to prepare the necessary agreement, and that the seal of the Council be affixed thereto when ready."

The Committee also submitted a detailed report on the scheme, the greater part of which was printed in our issue for March 2.

The Chairman of the Committee (Mr. Waterlow) having described the scheme,

Mr. Peel moved to add the following words : "On the clear understanding that if the Council does proceed with the buildings, the cottages may be so constructed that the rents demanded should be within the means of the class earning less than 30s. a week."

Mr. Williams seconded, but the amendment was defeated, and the Committee's recommendations were agreed to.

Lot's-road Pumping Station.—The Drainage Committee recommended, and it was agreed, after discussion,

"That the estimate of 15,000*l.* submitted by the Finance Committee be approved; that the erection of the engine-house and other buildings, as well as the execution of the remainder of the underground work on the site of the proposed new pumping station at Lot's-road, Chelsea, be carried out without the intervention of the contractor in accordance with the drawings prepared by the engineer; and that the drawings, specification and estimate of 35,300*l.* be accordingly referred to the manager of works for the purpose."

Line of Frontage—Sorting Office, Brixton.—The Building Act Committee brought up a report containing the following paragraph :—

"We have been in communication with H.M. Office of Works with reference to the frontage of a proposed post-office sorting-office on a site at the rear of No. 322, Brixton-road, Stockwell, fronting on Wynne-road. Section 202 of the London Building Act, 1894, exempts from the provisions of the London Building Act, 1894, 'any building, structure, or work vested in, or in the occupation of, any department of his Majesty's Government,' and therefore the Council has no power to require that the line of frontage should be kept. In October, 1898, we received a communication from the Post-office calling attention to the purchase of the site, and stating that although the Postmaster-General would not desire to adopt a building line contrary to the wishes of the Council, yet that in the present case, in order to provide sufficient accommodation, it would be necessary to build up to the pavement in Wynne-road. After negotiations, however, with his Majesty's Office of Works, that department has submitted a plan showing the setting back of the front of the proposed building about 5ft. from the inside of the pavement on the south side of Wynne-road. The general line of buildings on the south side of the road is well defined, and is set back 8 ft. 6 in. from the public way. Having regard to all the circumstances, we have accepted the proposal, which we consider satisfactory, and we report the facts for the information of the Council."

Ground Plan and Annual Map of London.—The Corporate Property Committee recommended, and it was agreed,—

"That, subject to the passing of the annual maintenance votes, the further expenditure be authorised of the sums included in the Corporate Property Committee's estimate, viz., 600*l.* and 560*l*, and of the sum included in the Local Government Committee's estimate, viz., 530*l*, during the year ending March 31, 1902, in connexion with the ownership, and detail sections of ground plan of London and of the annual map of London respectively."

Christ's Hospital.—The Historical Records and Buildings Committee stated that they had given consideration to proposals contained in the Bill now before Parliament with reference to Christ's Hospital, Newgate-street. They felt that the entire removal of the buildings on the area would result in the demolition of several features of distinct historical and antiquarian interest. This would be an undoubted loss to London, and they have asked the Parliamentary Committee to take steps to oppose the Bill.

Buildings of Historical or Architectural Interest.—The same Committee recommended, and it was agreed, that the first part of a register of buildings of historical or architectural interest in London be placed on sale at 10s. 6d. per copy.

Holborn to the Strand—Paving, &c., near St. Clement Danes Church.—The Improvements Committee recommended, and it was agreed, that the working drawings, specification, and estimate of the cost (6,294*l.*) of the paving and other works in the Strand near the churches of St. Clement Danes and of St. Mary-le-Strand be referred to the Works Manager with a view to the work being carried out without the intervention of a contractor, it being understood that the work around St. Clement Danes be proceeded with by night and day.

Carr's Restaurant.—The same Committee recommended, and it was agreed,

"That, in connexion with the Holborn to Strand improvement, the approval of the Council be given to the action of the Improvements Committee (*a*) in approving the design No. 3 submitted to the Improvements Committee on March 27, 1901, by Mr. George Cox for the elevation of the new Carr's restaurant on the north-eastern frontage of the proposed crescent road close to the Law Courts; and (*b*) in extending the period during which Mr. Cox is permitted to retain possession of the land referred to in Section 47, Sub-Section 3, of the London County Council (Improvements) Act, 1899."

Sewer Work.—On the recommendation of the Main Drainage Committee, it was agreed that, subject to the passing of the annual maintenance votes for 1901-2, the expenditure of 6,450*l.* be sanctioned for the execution of repairs to the Ravensbourne and Sydenham sewer between Loampit Vale and Catford Bridge, and that the work be carried out by the Works Department as a jobbing work.

Tender.—On the recommendation of the Public Control Committee, it was agreed that the tender of Messrs. Parkinson and W. & B. Cowan, Limited, for the sum of 1,680*l.* for the supply and fixing of plant at the Newington gas-meter testing office be accepted.

New Theatre, Islington.—The Theatres and Music-halls Committee reported that they had considered an application by Mr. F. Matcham on behalf of Mr. F. W. Purcell, for a certificate under the Metropolis Management and Building Acts Amendment Act, 1878, in respect of a theatre which it is proposed to erect in the Holloway-road, Islington, and which will be known as the Marlborough Theatre. The total length of the boundaries of the site is 536 ft., of which 78 ft. will front to Holloway-road, which is 83 ft. in width, with an additional forecourt 58 ft. deep in front of the theatre, 190 ft. to a new footway (Macready-place) 20 ft. in width, and 78 ft. to a 10-ft. passageway communicating at one end with Macready-place and at the other with Warlters-road, which is 20 ft. in width. The theatre is planned to accommodate 1,946 persons, and subject to certain conditions the plans may, stated the Committee, be considered as fulfilling the Council's requirements.

The Council, having transacted other business, adjourned for the Easter recess.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Greenwich.—The retention of a lavatory and water-closet addition to No. 11, Kidbrook Park-road, Lee, to abut upon Harvey-road (Mr. T. Hollis for the Bowater Decorating and Sanitary Company).—Consent.

Dulwich.—Wood and tile pents at the entrances to fourteen houses on the south side of Woodwarde-road, East Dulwich (Messrs. Allen & Hoar for Mr. J. Frampton).—Consent.

Dulwich.—Bay-windows to fourteen houses on the south side of Woodwarde-road, East Dulwich

(Messrs. Allen & Hoar for Mr. J. Frampton).—Consent.

Paddington, North.—A one-story porch in front of a proposed parish hall on the east side of Macroom-road, St. Peter's Park, Paddington (Mr. J. S. Alder for the Rev. W. P. Legg).—Consent.

Width of Way and Lines of Frontage.

Kensington, South.—A two-story addition to No. 39, Victoria-road, Kensington, to abut upon St. Alban's-road (Messrs. C. Liney & Sons for Mr. J. E. Jarvis).—Consent.

St. Pancras West.—A one-story addition to the Regent's Park Riding School, on the north-east side of Park Village East, Regent's Park, adjoining the York and Albany Hotel (Mr. W. Woodward for Mr. B. Perry).—Consent.

Strand.—The rebuilding of Nos. 35, 36, and 37, King-street, and No. 8, Little Marlborough-street, Golden-square, St. James's (Mr. A. Burr for Mr. T. Stevens).—Consent.

Width of Way and Space at Rear.

Battersea.—Four houses, with shops on the ground floor, on the site of Nos. 148 to 158 (even numbers only, inclusive), Falcon-road, Battersea, with a portion of the northernmost house and the boundary fence thereof at less than the prescribed distance from the centre of a passage-way leading from Falcon-road to Clapham Junction, and with irregular open spaces at the rear of such houses (Messrs. Treadwell & Martin for Mrs. J. Tavener).—Consent.

Dwellings for the Working Classes.

Kennington.—That the Council do make an order as follows:—Whereas Mr. S. Bircham, of Waterloo Station, S.E., on the 7th day of March, 1901, under the provisions of Section 42 of the London Building Act, 1894, delivered on behalf of the London and South Western Railway Company, at the County Hall, plans of four blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on the site of Nos. 48 to 72 (even numbers only, inclusive), South Lambeth-road, Kennington, at the corner of Miles-street. . . . Now the Council does by this order sanction the deposited block plan and block sections, so far as Section 42 of the said Act is concerned.—Agreed.

Alteration to Building.

Dulwich.—A box-room in the roof of No. 21, Stradella-road, Herne Hill, without the walls of the building being thickened so as to make such walls comply with the first schedule of the Act (Mr. J. J. Christian).—Consent.

GENERAL BUILDING NEWS.

RESTORATION OF ASHTON CHURCH, DEVONSHIRE.—The parish church at Ashton was re-opened on the 16th ult., after partial restoration. The work of restoration was carried out by Mr. Herbert Read, of Exeter, the architect being Mr. E. C. Ponting, of Marlborough. The wagon-shaped roofs and all the timbers, with the exception of part of the moulding of the purlins and principal ribs, which were hidden with lath and plaster, have been renovated. The ribs, purlins, rafters, &c., have been repaired in English oak, and are now left exposed. The lead gutter has been recast, and the date 1688 replaced upon it, together with the date 1900. The outside roofs have been covered with the best Westmorland green slates.

HOSPITAL, ST. ANDREWS, FIFE.—A hospital is to be built on a site at the east end of Abbey Park, St. Andrews. Plans have been prepared by Mr. Charles F. Anderson, St. Andrews.

MISSION CHURCH, BARNSLEY.—The foundation-stone of the new mission church of St. Mary Magdalene, at Measbro' Dyke, was laid on the 25th ult. Messrs. Senior & Clegg were the architects.

VOLUNTEER DRILL HALL, BLAYDON, DURHAM.—A drill hall for the 5th Detachment V.B. Durham Light Infantry was opened at Blaydon on the 27th ult. The hall measures 90 ft. by 40 ft. The contractor was Mrs. M. A. Armstrong, of Blaydon. Mr. M. A. Graham, of Newcastle, is the architect.

EPISCOPAL CHURCH, GUARDBRIDGE, FIFE.—An Episcopal church has been built at Guardbridge from plans by Mr. Charles F. Anderson, St. Andrews.

BUSINESS PREMISES, HAMPSTEAD-ROAD.—An addition has been made to Messrs. Oetzmann & Co.'s premises at the corner of Hampstead-road and Drummond-street. Mr. Fred. Eales was the architect.

MISSION HALL, BRADFORD.—A mission hall for the Methodists is to be erected in Leeds-road, Bradford, from plans by Mr. W. J. Morley, of Bradford.

BONDED STORES, EDINBURGH.—A new bonded warehouse is to be erected at St. Leonards, from plans prepared by Messrs. Leadbetter & Fairley, architects, Edinburgh. The present area is to be increased, and the new premises will extend to a distance of 750 ft., with an average width of 70 ft. The eastern portion of the buildings will be occupied by bonded warehouses five floors in height. This part will measure 304 ft., and will average 65 ft. in width. The northern portion, measuring 245 ft. by 71 ft., will be occupied as cellars, bottle-washing premises, &c., on the ground floor, and the second flat is to be used as the dispatch department. The centre of the building will consist of vatting and mixing cellars, a large covered court, offices for the company and Excise, &c. The elevation to the Queen's Park will be built of stone. The reconstruction of the premises is expected to cost about 25,000*l.*

HOUSES FOR THE WORKING CLASSES, DARLINGTON.—According to the *Darlington Star*, Messrs. Robert Stephenson & Co., Limited., have prepared plans for the erection of 582 houses on land east of the North-Eastern Railway at Thompson-street, adjoining the new engine works, now in course of erection at Darlington. Thompson-street is to be extended eastwards to Salter's-lane, and thereby direct access will be afforded to the villages of Haughton-le-Skerne, Burdon, and Harrowgate. The length of the intended new streets is as follows:—40 ft. wide streets, 3,614 yd.; 80 ft. street, 203 yds.; and the length of 15 ft. wide back streets will be 2,309 yds. Four classes of houses are provided for, viz., 376 with a frontage of 16 ft. each, 116 with a frontage of 18 ft. each, fifty-nine with a frontage of 21 ft., each, and 31 semi-detached cottages, also with a frontage of 21 ft. each cottage. The latter will front the 80-ft. street above referred to, which forms one approach to the works, and which is to be planted with trees to form an avenue. The general plan of this intended addition to the town of Darlington is, first, by an eastward extension of Thompson-street to Salter's-lane, out of which said extension nine streets will be carried southwards for a distance of about 90 yards, and these latter streets will be cut across by other two streets, which will be roughly parallel with Thompson-street extension, the 80-ft. wide avenue being the central one of those running northwards out of Thompson-street extension. Two considerable areas of land, each to be planted round with trees, have been reserved for pleasure or recreation grounds. The accommodation to be provided will be as follows:—First, in the cottages of 16-ft. frontage, sitting-room, with bay window, 11 ft. 6 in. square; kitchen, 15 ft. 3 in. by 12 ft.; scullery (with set pot), 8 ft. 6 in. by 6 ft.; ample pantry accommodation, paved yard, and conveniences. Upstairs, three bedrooms, 15 ft. 3 in. by 11 ft. 6 in., 15 ft. 3 in. by 12 ft., 11 ft. 2 in. by 6 ft., and a bath. In elevation, the roof to bay window is carried across the full frontage of the cottage, supported on ornamental brackets. The entrance is provided with a screen door, glazed in coloured glass. The walls are to be built of light-coloured open clamp bricks. The cottage of 18 ft. frontage will have two sitting-rooms (one of them with a bay window), 13 ft. square and 15 ft. by 11 ft. respectively; kitchen 12 ft. by 9 ft.; scullery (with set pot), 9 ft. square; ample pantry accommodation, large paved yard and conveniences. Upstairs, four bedrooms, 13 ft. by 11 ft., 15 ft. by 11 ft., 13 ft. by 9 ft., and 9 ft. by 6 ft. respectively There is also a bathroom, with lavatory basin, and separate water-closet. In elevation, the screen door is at back to form a porch. The eaves are made to overhang on the projecting spars. The roof will be in red tiles. The cottage of 21 ft. frontage will have two bay-windowed sitting-rooms, 16 ft. by 14 ft. and 15 ft. by 13 ft. 4 in.; kitchen, 15 ft. by 11 ft.; scullery, 11 ft. by 8 ft.; good pantry and larder; detached washhouse in yard, which is cemented, leaving spaces for flower borders. Upstairs, two bay-windowed bedrooms, 16 ft. by 13 ft. and 15 ft. by 13 ft.; two smaller bedrooms, 14 ft. 6 in. by 11 ft. and 11 ft. 6 in. by 6 ft. 6 in. There is a bathroom, with lavatory basin, and a separate water-closet. There are two attics, 20 ft. by 10 ft. and 13 ft. by 10 ft. Half way on the roof is a low three-light rectangular window. The semi-detached cottage will have a dining-room 14 ft. 6 in. by 12 ft. 6 in., and a parlour 14 ft. 6 in. square, both bay-windowed; kitchen, 14 ft. by 11 ft.; scullery and pantry, 11 ft. by 8 ft.; also the usual outbuildings, a paved yard, and ornamental flower borders. Upstairs there will be two bay-windowed bedrooms, each 14 ft. 6 in. by 12 ft. 6 in.; a bathroom, lavatory, and water-closet, 11 ft. by 7 ft.; and two attic bedrooms, 14 ft. 6 in. by 12 ft. 6 in. and 8 ft. by 7 ft. 6 in. The elevation consists of four bay windows, two on the ground floor and two above, with the two entrance doors between those on the ground floor. The upper bay windows are each roofed back against an ornamental gable, pierced with ventilating opening, and surmounted by finial. The front wall is brought forward over the entrance doors to form a porch. There are two rectangular roof lights.

BUNGALOWS, &C., MAIDENHEAD.—Building operations are about to be commenced on the Fishery Estate, Maidenhead. The first road parallel to the river is to be at once constructed and an ornamental bridge over the creek erected. Designs for several of the bungalows to be erected on the estate have been prepared by the architects for the estate, Messrs. Palgrave & Co., Westminster, under whose direction the developments are to be carried out.

UNITED METHODIST FREE CHURCH, SHERNHALL-STREET, WALTHAMSTOW.—This church was opened on the 28th ult. The buildings are erected on a prominent site at the corner of Shernhall-street and Oliver-road, the style being Early Decorated Gothic. The church is flanked on one side by a bold square tower, which rises to a considerable height. A large church parlour is placed alongside the church on the opposite side. The facings are of red brick with Bath stone dressings; the roofs are of green slates; moulded triple arches of Bath stone, supported by Norwegian granite shafts with carved caps, divide the nave from the apse, where the choir and organ are accommodated. The choir has a traceried stone front or dwarf screen. The pulpit occupies the space under the central arch, and is the centre from which all the seating radiates (the seats being circular on plan), so that all the congregation immediately face the preacher. The roof is of hammer-beam construction, with open-timber spandrels of tracery work. The metal work is all of wrought iron and copper. The church will accommodate about 750 persons in a mixed congregation, all on the ground floor. Provision is made for future end gallery to accommodate about 100 persons. The contract was let to Mr. J. P. Carter, Grays, Essex, for 5,609*l.* The architects whose design was selected in competition are Messrs. George Baines and Reginald Palmer Baines, Clement's Inn, Strand, W.C.

BATH ABBEY RESTORATION SCHEME.—At the Guildhall, Bath, on the 28th ult., a meeting on behalf of the fund for repairing the abbey was held under the chairmanship of the Mayor (Mr. T. B. Silcock). The Rev. Canon Quirk submitted a statement from the Executive Committee, which now reported that the last bit of work on the west front was in hand. But other necessary work had been found, and the architect (Mr. T. G. Jackson) had pointed out the condition of the flying buttresses on the south-east choir, and that the pinnacles and battlements were loose and decayed. The five buttresses on that part of the church were in a bad state. Two of them must be at once completely rebuilt, and the remaining three could only be saved after considerable repair and restoration. He estimated that each buttress would cost 350*l.*, and the various smaller repairs 200*l.* In addition, a dangerous defect had been found in the wooden roof of the choir, and to strengthen that portion of the church the cost would be 235*l.* Towards that increased expenditure the committee had in hand a sum of 500*l.* to 600*l.* over and above the liability of previous contracts. It was considered that an additional sum of 2,000*l.* would be required to meet the cost of the extra necessary repairs. The committee had now decided to appeal to the public at large for 2,000*l.*, with a supplementary estimate of 600*l.* to carry out the repairs.

FLATS, PUTNEY.—A building is in course of erection at the corner of the Platt, Lower Richmond-road, Putney, facing the river, and will be called "University-mansions." It will consist of self-contained residential flats of iron and steel construction, and will be fireproof. An electric lift will be erected in the well of the principal staircase and give access to five flats on each floor. The ground floor is to be adapted to shops, the corner being bank premises. Messrs. Palgrave & Co., Westminster, are the architects, and Messrs. Whitehead & Co., Limited, are the general contractors. The cost (with the site) is about 30,000*l.*

FOREIGN.

FRANCE.—The City Council of Paris has decided on transforming the Hôtel de Lauzun into a museum in which will be placed the curious collection of engravings now at the Carnavet Museum. The building will be preserved in its existing state, but will be provided with furniture of the seventeenth and eighteenth centuries, so as to form a historical museum of this class of work.——The Government has presented to the "Musée de l'Armée" an important collection of water-colours by Pierre Lecomte and Armand Dumarescq, representing the French military uniforms under the First Empire, the Restoration of July, and the Second Empire.——The Académie des Beaux-Arts has elected M. Venturi, archæologist, of Milan, as a foreign corresponding member, in place of Verdi.——The Committee of the Louvre has purchased for the gallery an important work by Raeburn.——The church of St. Clothilde, at Reims, recently built from the designs of M. Gosset, has just been formally consecrated.——M. Daillion, the sculptor, has just completed the model for the bronze statue of Pasteur to be erected in the little town of Arbois. M. Debrie, the architect, has been commissioned to desigh the pedestal, which will be decorated with two bas-reliefs in bronze commemorating Pasteur's discoveries, and will be surrounded by a decorative balustrade.——We have to record the death of M. Charles Cazin, an artist distinguished both in figure subjects and landscape. He died at a small town in the Department of the Var, where he had gone to winter for his health. He was suffering from a disease of the heart known to be incurable. Cazin was born in 1841 at Samer. He was entrusted with the commission of completing Puvis de Chavannes' unfinished frescoes at the Panthéon. At the New Salon Cazin was President of the Section of "Objets d'Art," which in fact owed its initiation to him. He was "Com-

mandeur" in the Legion of Honour, and received a gold medal at the recent International Exhibition. Some further remarks in regard to him are included in the "Letter from Paris" in the present issue.

MISCELLANEOUS.

THE STUDENT'S COLUMN.—Our Student's Column article ("Sanitary Fittings and Plumbing") is unavoidably held over until next week.

LYCH GATE, NORTHMOLTON CHURCH, DEVONSHIRE.—A lych gate has been erected at Northmolton Church. The walls are of local stone, with dressings of Dartmoor granite. The woodwork is of English oak and the roof of tiles. The masonry was constructed by Messrs. Sanders & Son, of Southmolton, the oak work being by Messrs. Harry Hems & Sons. The lych gate was designed by Mr. James Crocker, of Exeter.

THE INSTITUTE OF SANITARY ENGINEERS (INCORPORATED).—At a meeting of the Election Committee held on the 13th ult., the following gentlemen were elected as Associates:—F. Bovey, Holloway; J. Buckeldee, Hillingdon; J. Whittaker, Pleasington. At the examination in sanitary engineering, held on the 22nd and 23rd ult., the following passed qualifying for Associateship:—W. J. Lane, Croydon; R. J. McKenn, Manchester.

HOUSING SCHEME NEAR BIRMINGHAM.—Mr. George Cadbury has conveyed to trustees an estate of about 330 acres in the parishes of Northfield and King's Norton, in Worcestershire, known as Bournville, about four miles from Birmingham. It is to be devoted to the purpose of ameliorating "the condition of the working class and labouring population in and around Birmingham and elsewhere, by the provision of improved dwellings, with gardens and open spaces, and by giving them facilities, should the trustees think it desirable to do so, for purchasing or acquiring the necessaries of life, and by such other means as the trustees may in their uncontrolled discretion think fit." About one-third of the estate has already been laid out. Three hundred and seventy cottages have been built, the majority of which are let, but 143 have been sold on terms advantageous to the purchasers. The peculiar feature of Mr. Cadbury's scheme is that the net proceeds of the rent-roll are to be wholly devoted to the extension of the scheme, and that model villages for artisans be multiplied on this automatic principle.

EAST RIDING ANTIQUARIAN SOCIETY.—A meeting of the East Riding Antiquarian Society was held at the Bayle Gate, Bridlington, on the 25th ult., when the Rev. E. Maule Cole read a paper on "Norman Work in Wold Churches." He pointed out, in the first place, that the chalk wolds of the East Riding were but little known, although more of the most beautiful and unique scenery, and greater wealth of all Norman churches, was to be found there than perhaps in any other part of Yorkshire. The period of the eleventh and early part of the twelfth century was a great age for the building of churches. At Cottam he found that only the old Norman font remains, although there was some stone work remarkably well preserved, dating back even to Saxon times. Old Norman remains of churches were also to be found at Cowlam, Driffield, Little Driffield, and Fridaythorpe. At North Grimston Church were to be seen specimens of the most ancient statuary existing in England. The chancel arch of this church was of plain Norman work, but the chief glory of the church was its font, which was very massive and most beautifully carved. Of the eleventh century church at Kirby the tower alone remained, and at Kilham the Norman doorway remained. Of Kirkburn, statements had been made respecting its being erected in 1119, but from a careful consideration of all its features, the rev. gentleman said he did not think it was built before 1150. The speaker went on to say that Weaverthorpe was thoroughly Norman in design. The church at Wetwang, he continued, was undergoing careful restoration, and many interesting features were being discovered. He considered this church the oldest on the Wolds—certainly of eleventh century date. There was doubtless an ancient Saxon church here, but there were obviously no remains, as Saxon churches were generally constructed of wood. Of the church at Wharram-le-Street, the tower was almost the only part remaining of the original church, and it was very ancient. In fact, according to the *Builder*, there were reasons for supposing it to be of pre-Conquest date. The chief glory of Wold Newton was the carving over the doorway. The south doorway of Thwing was very interesting, and there were many masons' marks remaining on the outside of Thwing corresponding with Weaverthorpe. No old church on the Wolds had any foundation to speak of except at Thwing, where the foundations were great boulders. In the opinion of the rev. gentleman the churches on the Wolds, so far as there existed remains which might be taken as a criterion, were built in the following relative order:—Last quarter of the eleventh century, Wharram-le-Street and Kirby Grindalythe; first quarter of the twelfth century, Weaverthorpe, Wold Newton, Thwing, Little Driffield, Fridaythorpe, and North Grimston; second quarter of the twelfth century, Wetwang, Kilham, Garton, and Kirkburn; last quarter of the twelfth century, Great Driffield. The Rev. C. V. Collier, F.S.A., followed with a paper on "Some Curious Papers Relating to Old Bridlington."

BOROUGH SURVEYORSHIP APPOINTMENT.—The question of reappointing officers was considered by the Borough Council, Hammersmith, on Wednesday evening last week. Mr. H. Mair, the present Surveyor, was appointed Borough Surveyor with an increase to his salary of 100*l.* per annum.

NORTH GATE OF CARDIFF.—Some ten or twelve years ago the late Marquess of Bute obtained the consent of the Cardiff Corporation to rebuild the North Gate of Cardiff, or, as it is sometimes written, the "Senghenydd Gate," on the North-road. What his lordship proposed to do was to reproduce, as far as possible, the structure which existed when Cardiff was a walled town, and from an architectural or antiquarian point of view the gateway would be an interesting monument of the past. Over the archway there was to be a passage leading to the Whitefriars' Abbey and the Castle gardens. The foundations for the gateway were laid, but a dispute with the masons put a stop to the work, and all that can now be seen on the North-road are the hoardings which surround the work on each side of the road. The Cardiff Corporation, having purchased Cathays Park for the erection of a Town Hall, Law Courts, and other public buildings, are anxious that the chief access to that park should not be impeded by a sort of Temple Bar, and they have approached Sir William Thomas Lewis with the object of getting the present Marquess of Bute's sanction to abandon the re-erection of the North Gate.—*Western Mail.*

SOME PROJECTED METROPOLITAN IMPROVEMENTS.—In the course of the current Session the London County Council will apply for leave to introduce their Money Bill to define the amounts which they may expend for various purposes in respect of which capital expenditure is necessary during the financial year beginning on April 1 next, and (on account of the next financial year) during the following six months. Amongst the fresh objects to which the proposed measure relates we may cite the widening and reconstruction of certain county bridges, including Waterloo Bridge; the lighting of Westminster Bridge with electricity; sites and buildings for the Council's new offices; the establishment of a working epileptic colony at Horton; reformatories for inebriate persons; workshops and technical schools; new main and intercepting sewers; a new pumping station; a service of passenger and parcel boats, with piers and landing places on the Thames; electrical testing plant and a shipping agency in connexion with industrial schools. The Bill extends also to the purchases of property, compensation, and rehousing of dispossessed persons, under the Council's various Acts of 1898-1900 in respect of the construction of the Thames Tunnel between Rotherhithe and Ratcliffe (for which an estimate of 846,750*l.* for the acquisition of property was adopted by them on October 23); an extension of Roehampton-street, Westminster; the widening of York-road, Battersea; Albert Embankment; Mare-street, Hackney (estimate, 660,750*l.*)*; Goswell-road (227,800*l.*); Archway-road, Highgate (6,000*l.*); Kentish Town-road (10,450*l.*); Battersea Rise (46,900*l.*); Wandsworth-road; High-street and Gardener's-lane, Putney (45,030*l.*); Nine Elms-lane (171,300); St. John-street, Clerkenwell (92,400*l.*); Southampton-row, Bloomsbury; High-street, Kensington; and elsewhere: together with the rebuilding of the old Gravel-lane, St. George-in-the-East; Rosemary Branch; and Cat and Mutton, Shoreditch, bridges; and an improvement of St. George's-place, Knightsbridge, under their General Powers Act of this current year. In the matter of open spaces the Council seek for powers to acquire the "Brickfield" at Limehouse, to enlarge the present recreation-ground at Newington, to purchase Albert-square, Ratcliffe, and to acquire land for the extension of Brockwell Park at Herne Hill. They further propose to acquire some land at Plumstead, with a view to adapting it for purposes of small holdings; to erect more coroners' courts; to remove certain existing gates, bars, and other obstructions in streets; and to obtain powers to expend money "in connexion with historical buildings." We may here add that at their meeting on January 15 the Council agreed to an estimate of 89,000*l.* for the erection of buildings, &c., to accommodate 300 insane male epileptical patients, with staff, in eight villas and other blocks upon an area of about 127 acres at Horton, and to a supplementary estimate of 96,500*l.* on behalf of the improvement (on the north side) of High-street, Kensington. They lately agreed to contribute 5,918*l.* (one-half of the net cost) towards the widening of King-street, Hammersmith, between No. 197 and St. Peter's Boys' School, both properties being included, and 4,300*l.* (one-third of the net cost) towards the widening of Great Church-lane, between No. 61 and Fulham Palace-road; to widen Central-street, St. Luke's (estimate, 81,250*l.*); and to widen Mansell-street, as an approach to the Tower Bridge, from High-street, Whitechapel, at a net estimated cost of 91,100*l.*, including 75,100*l.* for the property to be taken and 7,500*l.* for the rehousing of persons displaced.

ELECTRIC LIGHTING, &C., EASTBOURNE.—On the 28th ult. at the Town Hall, Eastbourne, Mr. E. A. Sandford Fawcett held a Local Government Board inquiry into applications by the Eastbourne Town Council for loans of 50,882*l.* for purposes of electric lighting and 15,500*l.* for the new Low Level Drive and Park. The consulting electrical engineer, Mr. Hawtayne, who was unable to attend, was represented by Mr. G. A. Zeden. The Town Council propose to erect new electric lighting works on a site at Roselands.

THE BUILDERS' ACCIDENT INSURANCE, LIMITED.—The twentieth annual general meeting of the Builders' Accident Insurance, Limited, was held at the company's offices, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, March 27, the chairman, Mr. Stanley G. Bird, presiding. The secretary, Mr. R. S. Henshaw, having read the minutes of the last meeting, the following report of the directors and the accounts for the year 1900 were received and adopted:—"The directors have the pleasure to present their report and the accounts for the twelve months ending December, 1900. During the period under review the company has received notice of 1,767 accidents. Although there has been some falling off in the premium income during the year, attributable to various causes, yet the directors are satisfied, from the financial result of the year, that the care which they have exercised in taking and discriminating risks has not been without advantage to the company, which is now in a very satisfactory position. The directors intend to propose certain terms on the renewal of existing policies which they think will be regarded as advantageous to the members and meet with the approval of all insurers. The directors have decided to enlarge the scope of the policy relating to risk of accidents to the public, and also to undertake the driving risk. The remuneration of the directors for the period will, in accordance with the articles of association, be left to the members at the general meeting. The directors regret to record the retirement of Mr. J. C. White from the board in consequence of ill-health. In accordance with the articles of association the following directors retire and are eligible for re-election, namely:—Messrs. T. Barnsley, Woodman Hill, A. Krauss, Wm. Nicholson, and G. H. Trollope." The general business then having been transacted, the meeting terminated with a vote of thanks to the chairman.

HOUSING OF THE WORKING CLASSES, MANCHESTER.—A deputation of the Birmingham City Council visited Manchester recently for the purpose of inspecting the labourers' dwellings erected in that city by the Manchester Corporation, and to confer with the authorities in regard thereto. The visitors were met at the station by the chief of the department, and proceeded at once to the Oldham-road block, consisting of 285 tenements with sixteen shops, the number of persons accommodated therein being 848. The buildings are five stories high, enclosing a large open quadrangle 4,500 square yards in extent. The dwellings on the upper floors are entered from balconies extending round all sides of the quadrangle, which are approached by stone staircases 5 ft. wide in straight flights leading immediately from the street. The tenements are arranged in pairs, and consist principally of two rooms, viz., a living room and a bedroom, 174 sq. ft. and 108 sq. ft. respectively. Tenements of only one room are also provided, the average size being about 130 sq. ft. All the rooms are 9 ft. high, and each tenement is provided with a well-ventilated food store and coal-locker. Each pair of two-roomed tenements is entered from a common lobby, and in a convenient place off this lobby a water-closet and sink is provided for joint use. Laundries and spacious drying rooms have been formed in the roof, well lighted and ventilated, and easily approached from the staircases. From Oldham-road the party proceeded to Sanitary-street, where they inspected labourers' dwellings of a different type, for 425 persons, and also Pollard-street, where a further block of buildings has been erected for 448 persons on a similar plan to the first-named block. From there the visitors were taken to the Harrison-street lodging-house for men, which occupies an area of 3,375 square yards, and consists of a building three stories high. Great interest was shown in the lavatories, washhouse, baths, and lockers which are provided for the lodgers, in addition to boot-cleaning-room, and barbers', tailors', and boot-makers' shops, which are at the disposal of the lodgers. There is a large smokeroom 60 ft. by 21 ft., dining-room 55 ft. by 39 ft., reading-room 50 ft. by 28 ft. Adjoining the dining-room are the lodgers' kitchen, scullery, and shop, the latter having communication with dining-room and smokeroom by means of serving windows. Dormitories, containing forty-nine cubicles, are situated on the ground floor at the rear of the entrance hall and on the south-east side. The first and second floors are entirely set apart for sleeping accommodation, and each floor contains 157 cubicles 5 ft. wide by 7 ft. 3 in. long, divided by varnished wood partitions 6 in. clear of the floor and 18 in. from the ceiling. The space between the ceiling and the top of the screens is filled in with open wire lattice-work, thus affording a through current of air along

* The several estimates cited were adopted by the Council at their meeting on October 23 last (see the *Builder* of October 27, 1900.)

each dormitory. Each cubicle is provided with a window opening direct into the open air. The dormitories are heated by means of steam radiators placed at the end of each wing and against the main staircases, and ventilated by air trunks taken through each floor and the roof to an exhaust fan worked by electricity. The building is lighted by electricity throughout, and contains accommodation for 363 men, and is within a penny tram ride of the city.

THE SOCIETY OF ORDAINED SURVEYORS.—The general examining board of this Society, which has its headquarters in Edinburgh, has met on five occasions during the past session. The examiners in the final examination, held in February, 1900, reported that one candidate, remitted for examination by the Town Council, had passed the examination, and that the other candidate, remitted for examination by the Sheriff, had failed. The board reported to the Town Council that the candidate remitted by the Council had passed the examination, and the candidate subsequently took the oath and signed the bond of caution, the cost of which, in terms of Rule 41, was defrayed by the board. In the preliminary examination, held in October, 1900, one candidate came forward for re-examination in one subject and succeeded in passing. Eight candidates came up for examination, of whom two were exempted altogether from examination on account of their having gained the requisite school leaving certificates. One candidate was exempted from examination in two subjects, and one candidate from examination in one subject, having gained leaving certificates in these subjects. The result of the examination was that seven candidates either passed or were exempted from the full preliminary examination, and that one candidate failed in three subjects and one in two subjects. The examination, as last year, was conducted by Mr. Robert Robertson, M.A., Headmaster of the Ladies' College, Queen-street. For the final examination held in October, 1900, one candidate came forward, remitted by the Town Council for examination. The examiners, Messrs. Lawrie, Morham, and Reid, reported that he had failed to pass the examination. For the forthcoming preliminary examination in April, 1901, three candidates have presented themselves, and one candidate has come forward for re-examination in two subjects. For the final examination one candidate has come forward for examination and one for re-examination.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.—The annual general meeting was held on Tuesday the 26th ult., when Mr. G. Appleton (of Messrs. Turton & Appleton), the new President, was introduced by the retiring President, Mr. H. Holloway. The report and balance-sheet for the past year were duly read, approved, and passed. Special notice was taken of the good offices of Mr. Treasurer Brooks, the hon. auditors, and the hon. solicitors. The Institution is now paying annual pensions of 24*l.* each to twenty-five builders' clerks' widows, also maintaining and educating three orphans, besides giving a considerable sum yearly in "temporary relief."

THE ELECTRIC LIGHTING BOARD SYSTEM.—The "E.L.B." system was demonstrated by the representatives of the Electric Lighting Boards Company before the members of the Royal Institution at their meeting on Friday evening last week, when all its latest improvements, including its flexible strips and many accessories, were shown. Among those present were Lord Rayleigh, Sir Fredk. Bramwell, Sir Fredk. Abel, Professor Sylvanus Thompson, Professor Dewar, Professor Perry, and other leading scientists.

APPOINTMENT.—The Westminster City Council received fifty-six applications for the office of City Engineer and Surveyor, the salary of which is 1,000*l.* a year. At a recent meeting of the Council the appointment was bestowed on Mr. James W. Bradley, the Borough Engineer of Wolverhampton.

COMMONS PRESERVATION SOCIETY.—A meeting of the Executive Committee of the Commons and Footpaths Preservation Society was held at 1, Great College-street, Westminster, on Monday afternoon, Lord Thring in the chair. It was reported that a valuable footpath, giving access to Epping Forest from Sewardstone, had been recently obstructed. The path, over which it was alleged the public possessed a right of way, ran from Daws Hill, Sewardstone, past Gilwell Park and Ludgate House to the Forest, and it afforded the shortest route for foot passengers between Sewardstone and Loughton, and opened up a very pretty district. It was stated that the Society had collected voluminous evidence, upon which a case was prepared and laid before it by Mr. Rawlinson, K.C., who had advised that there was a strong *prima facie* case for a right of way. Up to the present, however, the Waltham Holy Cross Urban District Council had declined to take the necessary steps under the Local Government Act, 1899, to secure the protection of any public rights which may exist. It was resolved, on the motion of Sir Robert Hunter, seconded by Lord Farrer: "That the Commons Preservation Society extremely regrets the reluctance of the Waltham Holy Cross Urban District Council to assert the public rights in respect of the footpath in question, and expresses its desire to give any support in its power to any local bodies or individuals who may be willing to contest the case." The report of the Board of Agriculture upon application for provisional orders for the regulation of Skipwith Common, Yorks, and the enclosure of Skipwith Common Fields, was considered. It appeared from inquiries made by the Society that the regulation of the Common, 826 acres in extent, would counterbalance the proposed enclosure of the Common Fields, the area of which is 321 acres, and it was decided not to oppose the proposal. A further report of the Board of Agriculture on an application for the enclosure of the heath lands and common fields in the parish of Sutton, Northampton, was also considered. It was stated that if the scheme was adopted 477 acres of common fields and 133 acres of open heath lands would be enclosed, while the only public allotments contemplated 5 acres for recreation and 4 acres for allotments. It was felt that, whatever might be said for the enclosure of the common fields, the heath land should be preserved, or an equivalent area of land allotted, for open space purposes, and it was determined to take such steps in Parliament as might be necessary to endeavour to give effect to the Society's views. The Secretary reported that since the last meeting of the Committee over forty fresh cases had been referred to the Society for advice or assistance.

THE PRESERVATION OF STONEHENGE.—The recent fall of stones at Stonehenge having led to much public discussion, Sir Edmund Antrobus, of Amesbury Abbey, Wiltshire, invited the Society of Antiquaries, the Wiltshire Archæological Society, and the Society for the Protection of Ancient Buildings to advise him with regard to the better preservation of the famous monument. A committee representing these three bodies met on the 26th ult., under the presidency of Viscount Dillon, the President of the Society of Antiquaries, at which meeting the following resolutions were passed:—"1. That this Committee approves of the suggested protection of Stonehenge by a wire fence not less than 4 ft. high, following by two sides the existing roads, and crossing on the west from the 331-ft. level on the north road to the 332-ft. level on the south road shown on the Ordnance Survey map. 2. That the Committee recommends, without prejudice to any legal question, that the Local Authorities be requested to agree to divert the existing trackway or ridgeway from Netheravon, now passing through the earth circle, so as to pass from the 302-ft. level to the 331 and 332-ft. levels in the Ordnance Survey map immediately west of Stonehenge. 3. That stones 6 and 7, with their lintel, and stone 56 (according to the numbering on Mr. Petrie's plan) be first examined with a view to maintaining them in a position of safety. 4. That in the opinion of this Committee stone 22 should be replaced, stone 21 be made safe, and the lintel of 21 and 22 be replaced in the most safe and conservative manner. The Committee also recommend the re-erection of stones 57 and 58 and their lintel 158. 5. That the instructions to custodians already in force be approved with a few suggested alterations. 6. That this Committee feels that it is impossible to overstate the value of the assistance which the County Council, the District Council, and the Parish Council of Amesbury can give to the efforts made to preserve this unique monument. 7. That these resolutions be sent to Sir Edmund Antrobus, with the earnest thanks of the Committee, for the part he is proposing to take in the preservation of Stonehenge."—*Standard.*

COUNTY ASYLUM, NAPSBURY, MIDDDESEX.—We read that Mr. Rowland Plumbe, architect, has been entrusted with the work of the new County Asylum for Middlesex at Napsbury. There will be 100 separate buildings to admit of the most perfect classification of the patients.

DEVELOPMENT OF BRIGGATE, LEEDS.—The Leeds Estates Company have just let another contract to Messrs. Armitage & Hodgson, contractors, of Leeds, for the erection of a restaurant, covering an area of about 400 yards, the rebuilding of the Greyhound Hotel in Vicar-lane, and the Dolphin Hotel in Vicar-lane, and the putting up of fourteen shops in King Edward-street, and eleven in the Cross Arcade and Queen Victoria-street. Contracts of the value of between 70,000*l.* and 80,000*l.* are also in the hands of Messrs. William Nicholson & Sons.

MEMORIAL WINDOW, ST. MICHAEL'S CHURCH, BUDE.—A stained-glass memorial window has been erected in St. Michael's Church, Bude. It was designed by Mr. G. H. Fellowes Prynne, London.

ELECTRIC LIGHTING, BELFAST.—On the 27th ult., at the Municipal Buildings, Belfast, Mr. P. C. Cowan, M.Inst.C.E., held a Local Government Board inquiry into an application by the Corporation of Belfast for sanction to a loan of 95,000*l.* for electric lighting purposes. Evidence was given by Mr. McCowen, the Superintendent of the Electrical Department.

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE, COVENTRY.—Mr. Hudson, barrister, who was appointed by the Board of Trade to act in the building trade dispute at Coventry, sat on the 1st inst. Notice had been given by the Master Builders' Association of a reduction of ½d. per hour and shorter hours during the two mid-winter months. The carpenters, joiners, and painters agreed to arbitration, but not the bricklayers and labourers, who were consequently locked out. Mr. Hudson found that the notice given was bad, being delivered a day too late, and that, therefore, the existing rules would stand.

CARPENTERS' STRIKE, YARMOUTH.—On the 1st inst. the carpenters and bricklayers of Yarmouth struck in consequence of the refusal of the employers to grant an increase in their wages of 1d. per hour.

BURY PAINTERS LOCKED OUT.—On the 30th ult., the dispute in the painting trade in Bury terminated in the men being locked out. Six months ago the men gave notice for a penny advance in wages, the notices expiring on April 1. Meanwhile the masters and men arranged matters so that the men made small concessions regarding the apprentice question and the overtime question, the masters agreeing to grant a halfpenny per hour advance in wages. The difference arose, however, with reference to the time for giving notice, the masters contending for any time. The men holding to the present practice, neither would give way, with the above-mentioned result.

CARPENTERS' STRIKE, DUDLEY.—The carpenters and joiners in Dudley and district came out on strike on the 1st inst., in consequence of the employers calling upon them to submit to a reduction in wages of from 8½d. to 8d. an hour.

LEGAL.

UNION LABOURERS' ACTION AGAINST BUILDERS.

THE cases of Powell *v.* Handscomb & Smith, and Purkiss *v.* "Same," came before his Honour Judge Russell, at the Croydon County Court, on Tuesday afternoon, the 26th ult. The plaintiffs were bricklayers' labourers belonging to the Labourers' Union, suing the defendant builders for difference in wages, paid at 6½d. per hour, 7d. per hour being demanded. Mr. Gardiner, instructed by their Union, appeared for the plaintiffs; and the defendants were represented by Mr. Newnham, under instructions from the Croydon and District Master Builders' Federation.

It appeared that Powell had been engaged on the defendants' works for two weeks and a day and Purkiss for a few days only, both the men being started by the foreman of the job without any specific agreement as to the wages. The foreman gave evidence to the effect that the only time 7d. per hour was mentioned by plaintiffs before dismissal was when Powell approached him with a view to taking on the scaffolding at an increased rate of ½d. per hour. He also produced the defendants' wages book, showing that the whole of the remaining labourers in the works were receiving 6½d. per hour.

Messrs. S. Page and D. Waller, builders, of the town, and Mr. E. J. Fairchild, secretary to the Federation, gave evidence as to the trade custom of setting on and payment, and also to prove that the before-mentioned arrangement as to the radius had never been acknowledged by the Croydon builders, who have an entirely independent organisation, comprising all the most important firms in the district, and whose maximum rate of wage has always been ½d. per hour less than the London union rate for all trades. The names of John Tidy and Messrs. Wenham Waters were put forward by the plaintiffs' solicitor as firms where Powell had previously worked in the town at the higher rate. The first was proved to be a piecework bricklayer or sub-contractor and the others the well-known firm of electrical engineers.

His Honour held that Powell, from the fact that he worked at the lower rate after receiving his wages the first week, had in effect agreed to it, and that both he and Purkiss, not inquiring as to the rate paid on the job, were set on by the foreman in accordance with the usual custom and entitled to the same rate of payment as the other labourers, which he held the evidence had proved to be 6½d. per hour for that district. He, therefore, gave judgment for the defendants in both cases.

The defendants' solicitor stated his clients did not ask for costs.

WORKMEN'S COMPENSATION ACT:

CAN DEPENDENTS BRING A SECOND ARBITRATION?

AT Marylebone County Court on Friday last week, before Deputy-Judge Cowper, an important application under the Workmen's Compensation Act was brought by Mrs. Kate O'Keefe, Crawford-street, Marylebone, on behalf of herself and children, the respondent being Mr. Henry Lovatt, builder and contractor, North End House, Fitzroy-avenue, Fulham, and Wolverhampton.

Mr. W. Thompson, counsel, appeared for the applicant, and Mr. F. Lowe, counsel, for the respondent.

The applicant's late husband, explained Mr. Thompson, had been in the employ of the respondent as a builder's labourer, and while working on a building in Bayswater-road, W., on February 1, 1899, fell from a scaffolding. Shortly afterwards the case came before Judge Stonor at Marylebone County Court, and the man was awarded compensation at the rate of 15s. a week. Subsequently the

unfortunate man died in consequence of the injuries which he sustained by the accident, and the present application was for leave to re-open the arbitration, with a view to an award of a lump sum being made to the man's dependents. On hearing of the man's death, the respondent ceased the payment of the compensation of 15s. a week.

Mr. Lowe contended that the Act did not provide for the dependents of a deceased person who had been awarded compensation under the Act—as in the present case—being entitled to a second arbitration.

Questions as to the interpretation of various portions of the Act were discussed at considerable length by counsel on either side.

Ultimately his Honour said that he had looked in vain for any clause in the Act which could be considered as entitling the dependents to bring a second arbitration under such circumstances as those in the present case. He therefore considered that the present application must fail.

It is understood that an appeal is likely to be made against the decision.

EMPLOYERS' LIABILITY ACT:

WHEN DO CRANE SKIPS BECOME DANGEROUS?

AT Brompton County Court on Monday, before Deputy-Judge Clement Lloyd and a jury, Thomas Dodge, a builder's labourer, 5, Merival-road, Putney, S.W., sought to recover damages, under the Employers' Liability Act, from Mr. Charles Wall, builder and contractor, Ashburnham Works, Lot's-road, Chelsea, the claim being in respect of personal injuries sustained by plaintiff, owing, it was said, to negligence for which the defendant was responsible.

Mr. J. W. Moyses, counsel, appeared for the plaintiff, and Mr. C. F. Henlé, solicitor, defended.

Mr. William Robert Pether, a civil engineer, was first called. He stated that on visiting the defendant's works shortly after the accident he was shown six crane skips, one of which was supposed to have been so defective as to cause the plaintiff's injuries. Each of these skips appeared to be in fairly good condition, with the exception of one which had new rivets at one of its corners, and also signs of having been hammered straight. In his opinion, it was not safe to set a man tipping skips who was not experienced at the work. The skip in question weighed about 4 cwt. when empty and about 24 cwt. when filled with earth.

The plaintiff stated that on December 17 last, having been in the employ of the defendant for about three or four weeks, he was working in a cutting at the new public baths, Walham Green. In the afternoon of that day his foreman, "Ring," came to him and said, "Dodge, go up and tip them skips; little Ginger" (another workman on the job) "has just met with an accident." He had never handled such skips before, and the foreman gave him no instructions as to how he should do the work. In accordance with the foreman's orders, he proceeded to tip the skips. The first that came up he tipped all right. The second skip which came up was loaded heavily on one side, and the side of the skip was bent in so much that the catch did not project outwards beyond the handle. In order to reach and release the catch he put his hand inside, between the handle and the side of the skip, the space here being large enough for him to have put in his head. He lifted the catch, the skip tipped over, but the corner of the skip, projecting outwards far beyond the side, caught his right hand against the bottom of the handle. The middle of his hand was seriously injured, and he had lost practically the whole of the use of his right forefinger. Since the accident he had only been able to do a few days' work per week.

Cross-examined: The only time that he had tipped skips prior to the accident was about sixteen years ago, when he assisted occasionally. These skips, however, were different from the one that caused the accident.

Other workmen corroborated as to the condition of the skip.

Mr. C. D. Collins, builder, Clapham, stated that at the request of the plaintiff's solicitors he had inspected certain skips used on the defendant's works. Some of the skips were in fair condition; one was in a very bad state, and another showed signs of being recently repaired. The side had been hammered out, and one of the corners had five or six new rivets.

Mr. Samuel Walsh Owen, M.R.C.S., &c., spoke as to the plaintiff's injuries. He considered that the man's injuries were permanent.

Mr. W. F. Sherard, M.R.C.S., &c., agreed generally with the evidence of the last witness.

For the defence Thomas Wright — known as "Ring"—said that he was foreman on the job in question. When the first man ("Ginger") met with his accident witness went to the plaintiff and said, "Dodge, what sort of a banksman are you?" By a banksman he meant a man to tip skips. The plaintiff replied that he could do the work, and witness then said, "Go up and empty the skips." Some of the skips on the job were in a very bad condition through being bent in at the sides. He did not, however, consider that the skips were dangerous, and there was no necessity for a man to put his hand between the side of the skip and the handle in order to release the catch.

Mr. Fredk. J. Smith, F.R.C.S., &c., totally disagreed with the medical evidence given on behalf of the plaintiff. He did not consider the man's injuries to be permanent; but, on the contrary, he found the hand almost restored to its normal condition.

William Weston, the defendant's general foreman, said that it was the constant lifting of the skips which bent in their sides. When skips were so bent they would be "usable," but the catch would, so to speak, be shortened. He did not consider the skip in question to have been in a dangerous condition.

The jury found in the plaintiff's favour, on the ground that the skip was defective, and that the foreman was negligent in not giving the plaintiff full instructions as to how he should do the work. They assessed the damages at 86*l*.

His Honour gave judgment accordingly, and allowed full costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

23,820.—A SIPHONICAL DISCHARGE FOR WATER-CLOSETS: *H. L. Doulton.*—A communication is made between the crown of the siphon and the upper end of the pipe that conveys a part of the flush which is delivered into a trap, and the outlet from the basin is dipped into the trap. By that arrangement the air becomes exhausted from the crown of the siphon, so as to start the discharge; a supplementary siphon is fitted for supplying the junction-pipe, and a water-waste preventer is used.

23,845.—THE SAWING OF STONE, GRANITE, &C.: *F. Fromholt.*—In order that granules of cast-iron or steel may be employed for abrading purposes with circular saws, either the saws or the granules are magnetised. The adherence of the abrading material is effected with a coil, which is disposed at the side of the saw, the current being conveyed through brushes.

23,868.—SPIGOT-AND-SOCKET PIPE-JOINTS: *F. Elrick, F. W. White, W. Ferguson, E. Herron, W. Bates, W. Dodd, and W. A. Fairbairn.*—A shoulder is fashioned upon the one pipe that it may help to keep the other pipe steady during the time that the space between the two is being filled in with material. The joint is described as being adapted for use with pipes of clay, stoneware, brass, or cast-iron.

23,906.—AN APPLIANCE FOR USE WITH CRANES, LOAD-TRANSPORTERS, &C.: *F. Temperley and F. R. Temperley.*—The inventors' object is to prevent hauling or hoisting ropes from falling below the tops of the pulleys upon the rope-carriers before they become closed after the passing of the traveller. They provide hangers or loops upon the traveller, which will hold up the ropes, and deliver them on to the pulleys, the pulleys being mounted upon pivotted carriers after the kind specified in No. 14,162, of 1897.

23,936.—AN ATTACHMENT FOR DOOR-KNOBS: *G. H. Burrows.*—Notches cut in a hole in the door-knob are engaged by teeth that project from the neck, which is fashioned also with a collar, against which the knob is fastened by a bending outwards of the teeth. The knob is made in two portions, whereof one fits within the other, and the two portions are fastened together by spinning the edge of one down over the shoulder of the other.

23,947.—AN APPLIANCE FOR USE WITH EXTINCTEURS: *F. C. Merryweather and C. F. W. Fakeman.*—For purposes of opening it the acid-bottle is caused to slide inside a cage, and when the extincteur is inverted a cutter cuts a thin membrane with which the bottle is closed. By a variant method a cam, which is turned with an outside handle, is so arranged as to be pressed against the membrane, and a frame at the top of the extincteur retains the acid-bottle; or mixing-blades are attached to the axis which turns the cam.

23,948.—KILNS FOR DRYING EARTHENWARE GOODS: *C. Dansard.*—At the side and along the length of the drying-chamber is a conduit for hot air, the air entering from a passage having apertures that are provided with dampers. Upon the other side of the drying-chamber waste or discharge passages are placed. The partitions may be either permanent or removable, and for working with air indirectly heated the conduit and flue may be joined with iron tubes. If the flue is made in two portions, one of them will receive the watery vapour and the other the gases of combustion, whilst chimney-shafts connected to the upper part of the flue will prevent the outlet apertures from becoming cool.

23,963.—MEANS OF CLEANING BASINS, BATHS, &C.: *Peck Bros. & Co.*—For removing dirt, &c., which has collected around the base of the top of a bath, washing-basin, &c., the inventor fashions a ribbed tube-shapened extension upon the base of the tap, and upon the extension he puts a shell of porcelain or similar material. The shell has inside grooves, and is so arranged that it will slide vertically upon ribs, whereby one can easily dislodge dirt from the base of the tap.

23,964.—THE MOULDING OF CLAY, ARTIFICIAL STONE, &C.: *C. Czerny and C. Schlimp.*—The feed-box is made whole with, or is firmly secured to, a die-block that moves beneath a fixed head, and propels the moulded brick slab or block on to the table; a cam and lever lift the moulding-box when it is filled for engagement with the die, so that the motion upwards of the lower die (under the action of a hydraulic plunger) will compress the completely enclosed clay or artificial stone. In the first instance the material within the mould is subjected to the preliminary pressure of water which has been admitted into the cylinder under a pressure of a relatively low amount, then water at an increased pressure is allowed to enter. When the block has been extruded from the mould on to the table through the entry of water at a low pressure into the cylinder the water is allowed to escape from the cylinder and weights force the plunger downwards, upon a shaft with lever and rod mechanism are the cams that work the supply and exhaust valves of the cylinder. The dislodgment of the mould-box during the reciprocation of the feed-box is obviated by means of the cheeks or flanges upon the sides of the upper die.

23,987.—AN INSTRUMENT FOR USE IN BUILDING WALLS: *A Gaefke.*—The contrivance is devised for use in the building of walls at a given angle to one another, and to furnish means of obtaining the true horizontal and plumb lines; two blades, which can be set at the angle desired, are joined at their bases with an angle-plate, when some courses of bricks have been laid the instrument will be supported by its being pushed in between two of the courses, the true plumb being determined by two levels mounted upon the blades; as the building continues the instrument is sustained with movable hooks that are inserted into the joints between the bricks, and the line is to be held with holders mounted upon dovetailed slides, which are adjusted on scales marked upon the blades and are fastened with set-screws.

24,062.—WORKING IN WOOD: *R. Boughton and F. E. Smith.*—For cutting a groove in a block of wood and preserving (in the shape of a stick) the removed material at the same time the cutter is shapened as a semi-cylindrical sheet. The depth of the cut is controlled with an adjustable piece, and the cutter, which may be enclosed within a case, and may have a row of teeth, can be driven by hand-power. A lug serves to turn the tool gradually for making the cut, and for the groove the right and left halves should be cut separately, with a reversal of the tool for the second cut.

24,110.—A CRAMP FOR CONCRETE, STONE, AND SIMILAR BLOCKS: *W. Shield.*—The contrivance is intended for cramping blocks together in the construction of breakwaters and kindred works. It consists of two arms, on the nearer side of each of which is fashioned a flattened or rounded bearing-surface, whilst on their remoter sides are heels that will bear against the surfaces of holes made in the blocks of material. In the heads of the clamping-arms are holes through which is passed a bolt that is to be tightened with a nut or otherwise, so as to draw the blocks and the arms towards one another.

24,126.—ELECTRICAL CURRENT METERS: *A. Wright and Mutual Electric Trust.*—For purposes of a maximum-demand indicator is made a vessel that holds liquid, and is fashioned in such a shape that the liquid is caused to flow from one portion of the vessel into the other without returning when the vessel is tilted (against the action of a spring) with a mechanism that comprises a sustaining-pulley, a core, and a coil carrying the current. The quantity of liquid transferred is measured with a scale upon one part of the vessel. The normal position of the vessel is adjusted with a removable stop and provision is made—in one form with a constricted tube—for checking the too quick flow of the liquid from one portion of the vessel into the other.

24,181.—A PAINT-SCRAPER: *F. H. Crocker.*—Through the length of the handle is passed a bolt, of which one end is squared so as to take a slot cut in the scraper, and the other end is screw-threaded for a nut, by which means the handle is forced to hold the scraper securely. When the handle is turned a little the pressure becomes relaxed and the scraper is liberated.

24,185.—A REGULATING VALVE FOR FLUSH WATER SERVICE: *H. M. Williams.*—A cam is attached to the axis of the balanced lever, which when it is lifted impinges against a stem so as to open a spring-controlled valve, whereupon the flush ensues. As the flush-water traverses the end of a pipe which communicates with the crown of the outlet siphon, the air becomes exhausted and the basin discharge is started. The leaking of water into a receiver at the remoter end of the balanced lever effects an automatical closing of the valve, the lever being in the end weighed down by the water so that the spring is thereby released to press upon and shut the valve. A screw which regulates the current of water into the receiver controls the duration of the flush.

24,187.—A CONTRIVANCE FOR BATH WATER SERVICE: *F. Simpson.*—The apparatus is devised for ensuring automatically the opening of the discharge valves at the expiration of a fixed interval of time. A cord forms a connexion between the valve and a spring-drum, which under normal conditions is held by a pawl which a link joins to an arm upon the axle of the drum; two oil vessels communicate by means of a passage which is provided with a cock, and are attached to a sleeve. The filled cylinder is horizontal when the mechanism is set for action, but as oil flows slowly into it the cylinder assumes a vertical position, whereupon a stop upon the sleeve lifts the radial arm upon the axle of the drum, which then begins to wind

the cord, and so to lift up the discharge valve. In a modified form of the general principle involved a pawl in engagement with a rack attached to the discharge valve is substituted for the spring-drum.

24,227.—TREADS FOR FLOORS, STAIRS, PAVEMENTS, &c.: *F. W. Huestis.*—A bedplate of some hard material, such as steel, is fashioned with slits, and with tongues turned up at a right angle. Strips of some non-slipping material are fastened between the tongues and pressed through holes in the baseplate, or through holes in the tongues, so as to engage with projections upon the latter. By another method the leaden or other non-slipping material is laid across the entire face of the bedplate evenly with the upper edges of the tongues.

24,311.—A GRIP FOR ROPES AND CHAINS: *M. Schimpf.*—The grip consists of two parts which are hinged together; the wedge-shapened end of one part is set in adjustment with a lever which is passed through the notch, and of which the forked end closes the two parts. Upon the pin which belongs to the same part works a slotted bar, provided with a ring for its attachment to the load; the grip upon the rope or chain can be increased by forming the bar in the shape of a wedge.

24,327.—CONTINUOUS STAIRWAYS: *F. M. Dodge.*—Over-lapping links, pivoted together and having cross-bars at intervals, constitute the chain, the corner-links being altered in their shape in order to afford allowance for flexure. Sprocket-wheels carry the chain-band. End rollers upon the cross-bars engage alternately with guide-grooves, so as to make treads and risers, and with another groove as the chain-band is returned.

24,375.—A COMPOUND FOR CLEANING CHIMNEYS: *T. Huson.*—For consuming or dispersing collected soot an admixture is made of nitrate of potash, sulphur, and some non-hygroscopic material such as sulphate of soda, an iron or alkaline sulphate, carbonate of soda, or other finely-divided silica or earth.

MEETINGS.

SATURDAY, APRIL 6.

Edinburgh Architectural Association. — Visit to Sauchie and Clackmannan Towers.

MONDAY, APRIL 8.

Bristol Society of Architects.—Annual General Meeting. Election of Officers and Council. 8 p m.

Dundee Institute of Architecture.—Visit to Brechin Cathedral and Edzell Castle.

WEDNESDAY, APRIL 10.

Edinburgh Architectural Society.—Mr. Percy E. Nobbs on "Impressions of a Tour in Italy."

THURSDAY, APRIL 11.

Sheffield Society of Architects and Surveyors.—Annual Meeting. Election of Officers, &c. 7 p.m.

FRIDAY, APRIL 12.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Iron-lined Tunnelling Construction," by Mr. A. Woodroffe Manton. 8 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. K. Edwards on "Warm-air Heating Apparatus and the Building Preparations Necessitated." 8 p.m.

SATURDAY, APRIL 13.

Institution of Junior Engineers.—Visit to Great Northern and City Railway Works to inspect plant. 3.30 p.m.

British Institute of Certified Carpenters.—Mr. G. Ellis on "How is the Future Workman to be Trained." 6 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 20.—By H. J. WAY & SON (at Newport).

Newport, Isle of Wight.—124, Lower St. James'-st., f. £410

March 22.—By ROBERT REID.

New Bond-st.—Haunch of Venison-yd., workshops and premises, u.t. 25 yrs., g.r. 1*l.* 2s. 6d., e.r. 150*l.* 1,000

3, Haunch of Venison-yd., u.t. 25 yrs., g.r. 1*l.* 7s. 6d., e.r. 75*l.* 660

Belgravia.—15, William-st., u.t. 18¾ yrs., g.r. 30*l.*, r. 280*l.* 2,975

Kensington.—Palace Gardens-ter., &c., 1 g.r.'s 110*l.*, u.t. 52 yrs., g.r. 5*l.* 2,310

March 25.—By JASPER J. KELF.

Walthamstow.—13 to 19 (odd), Storey-rd., u.t. 79 yrs., g.r. 21*l.*, r. 91*l.* 400

12 and 20, St. Mary's-rd., f., r. 60*l.* 910

35, Folkestone-rd., u.t. 84¼ yrs., g.r. 4*l.* 10s., r. 32*l.* 250

Leyton.—7, Belmont Park-rd., u.t. 95 yrs., g.r. 5*l.* 220

By ROGERS BROS.

Kennington.—26, St. Agnes-pl., u.t. 78 yrs., g.r. 9*l.* 564

Lambeth.—37, Tenison-st., u.t. 22 yrs., g.r. 2*l.* 10s. 445

Peckham.—19 to 29 (odd), Blenheim-grove, u.t. 52 yrs., g.r. 27*l.* 1,645

13 to 27 (odd), Nunhead-grove, u.t. 56 yrs., g.r. 24*l.* 1,680

63, Bird-in-Bush-rd., u.t. 66 yrs., g.r. 5*l.* 5s. } 470

Dulwich.—191, Landells-rd., u.t. 66 yrs., g.r. 7*l.* }

By WALFORD & WILSHIN.

Camberwell.—18 and 19, Dumbleton-rd., u.t. 72 yrs., g.r. 11*l.*, r. 60*l.* 560

By HUMBERT & FLINT (at Watford).

Watford, Herts.—Park-av., &c., 129 plots of land, f. 8,447

Brighton-rd., &c., thirty-seven plots of building land, f. £1,275

March 26.—By DEBENHAM, TEWSON, & CO.

Upper East Smithfield.—No. 40, area 2,180 ft., f., r. 75*l.* 1,500

New Malden, Surrey.—12, Derby Villas, u.t. 64 yrs., g.r. 7*l.*, r. 30*l.* 250

By C. H. FRIEND & CO.

Hampstead.—1A, 2A, and 3A, White Bear-lane, u.t. 81 yrs., g.r. 21*l.*, r. 110*l.* 16s. 900

By RUTLEY, SON, & VINE.

Hampstead-rd.—6 and 8, Edward-st., u.t. 23½ yrs., g.r. 16*l.* 16s., r. 100*l.* 700

Somers Town.—20, Barclay-st., u.t. 19 yrs., g.r. 4*l.*, r. 30*l.* 195

St. Pancras.—13, Penryn-st., u.t. 49 yrs., g.r. 5*l.*, r. 30*l.* 450

Haverstock-hill.—2 and 4, Adelaide-rd., u.t. 39½ yrs., g.r. 10*l.*, r. 105*l.* 1,140

13, Crogsland-rd., u.t. 65 yrs., g.r. 8*l.*, e.r. 60*l.* 595

Tottenham.—83 and 90, St. Ann's-rd., u.t. 73 yrs., g.r. 13*l.*, r. 66*l.* 580

Holloway.—20, Hungerford-rd., u.t. 41 yrs., g.r. 8*l.* 8s., r. 50*l.* 545

By FREDERICK WARMAN.

Fulham.—64, 66, 68, and 72, Sherbrooke-rd., u.t. 975 yrs., g.r. 15*l.* 1,435

Highbury.—13, Highbury-ter., f., e.r. 70*l.* 1,015

Holloway.—23, Yerbury-rd., u.t. 67 yrs., g.r. 7*l.*, e.r. 48*l.* 530

By SHAFTO H. SIKES (at Melton Mowbray).

Melton Mowbray, Leicester.—Six enclosures of land, with buildings thereon, 19 a. 0 r. 38 p., f. 960

By MORETON RICHES (at Battersea).

Clapham.—89 and 91, Marney-rd., u.t. 84½ yrs., g.r. 14*l.*, r. 72*l.* 760

Wandsworth.—65, 67, and 71, Westover-rd., u.t. 90 yrs., g.r. 22*l.* 10s., r. 124*l.* 1,415

By E. FERGUSSON TAYLOR (at New Barnet).

Hatfield, Herts.—North-rd., two freehold cottages, r. 26*l.* 260

By J. C. PLATT (at Hammersmith).

Hammersmith.—3 and 4, George-st., u.t. 16 yrs., g.r. 10*l.* 240

Shepherd's Bush.—9, Lena-gardens, u.t. 75½ yrs., g.r. 8*l.*, e.r. 50*l.* 430

By THORNBORROW & CO. (at Penrith).

Greystoke, Cumberland.—The Land Ends Estate, 73 a. 1 r. 32 p., f. 925

Barton, Cumberland.—A larch plantation and 20 cattlegaits, f. 104

By H. J. CHEFFINS (at Saffron Walden).

Duxford, Cambs.—The Firs and cottage adjoining, f. 205

Debden, Essex.—Log Hall Farm, 14 a. 2 r. 31 p., c. 330

Rothers Farm, 55 a. 2 r. 34 p., f. 810

Freehold residence and three cottages 247

March 27.—By. H. DONALDSON & SON.

Stamford-hill.—21, Paignton-rd., u.t. 69 yrs., g.r. 5*l.* 225

Dalston.—31, Lansdowne-rd., u.t. 50¼ yrs., g.r. 9*l.*, e.r. 48*l.* 610

By FULLER, HORSEY, SONS & CASSELL.

Tovil, Kent.—1 to 4, Tovil-green Cottages, area 0 a. 1 r. 20 p., f., r. 44*l.* 17s. 590

By RUSHWORTH & STEVENS.

Hackney.—141, Amhurst-rd., u.t. 65 yrs., g.r. nil. 605

Kentish Town.—112, Carlton-rd., u.t. 50 yrs., g.r. 6*l.*, r. 42*l.* 390

Camberwell.—17 to 22, Elfin-rd., u.t. 62½ yrs., g.r. 18*l.* 1,510

Elfin-rd., The New Vauxhall Tavern, u.t. 62½ yrs., g.r., &c., 20*l.* 5s., r. 50*l.* 1,520

By R. TIDEY & SON.

Islington.—45, Oakley-rd., u.t. 40 yrs., g.r. 6*l.*, r. 45*l.* 520

Hornsey Rise.—No. 55, r. 42*l.*; also plot of ground adjoining, area 7,600 ft., u.t. 65 yrs., g.r. 10*l.* 5s. 425

Kingsland.—32 to 44 (even), Acton-st., u.t. 18 yrs., g.r. 21*l.* 860

By WAGSTAFF & SONS.

Canonbury.—17, Alwyne-rd, u.t. 44½ yrs., g.r. 8*l.*, r. 60*l.* 500

By S. WALKER & SON.

Dalston.—49, Mayfield-rd., u.t. 36½ yrs., g.r. 5*l.* 5s., r. 36*l.* 280

By Messrs. SPELMAN (at Norwich).

Norwich.—St. Clement's Hill, The Elms and ½ acre, f. 760

Sprowston, six freehold cottages 400

Runhall, Norfolk.—Freehold cottage, blacksmith's shop and premises, and 2 a. 2 r. 6 p. 128

By BALCH & BALCH (at Camden Town).

Camden Town.—9 and 10, Priory-st., 6 and 8, Priory-pl., and 9A, Jeffrey-pl., u.t. 23½ yrs., g.r. 7*l.* 1,000

Holloway.—21 to 31 (odd), 30 and 32, Poynings-rd., u.t. 70 yrs., g.r. 42*l.*, r. 269*l.* 2,940

March 28.—By FAREBROTHER, ELLIS, & CO.

Lincoln's Inn-fields.—Nos. 1 and 2, area 4,100 ft., f., r. 1,046*l.* 19,000

By H. W. HARDY.

Chiswick.—10, 12, and 14, Paxton-rd., f., r. 78*l.* 975

By HAWKINS & EDGECOMBE.

Plumstead, Kent.—99 to 105 (odd), Villas-rd., u.t. 15 yrs., g.r. 8*l.* 380

21 to 24, Walmer-rd., u.t. 25 yrs., g.r. 8*l.* 675

By LINNETT & LANE.

Willesden.—22 and 24, Cobbold-rd., u.t. 98 yrs., g.r. 10*l.* 540

By W. MARTIN & CO.

Dulwich.—7 to 13 (odd), Hillsboro'-rd., u.t. 63 yrs., g.r. 30*l.*, r. 146*l.* 1,505

By ORGILL, MARKS, & LAWRENCE.

Margate, Kent.—Fort Hill, The Kursaal, comprising Robin Ladd's storehouse, shop and lands adjoining, part f. and part u.t. 72 yrs., g.r. nil; together with right and interest of the Margate and Southend Kursaals 16,000

By WM. STEVENS.

Hackney.—36, Greenwood-rd., u.t. 52 yrs., g.r. 7*l.*, e.r. 70*l.* 650

Clerkenwell.—11, 12, and 13, Thomas-st., u.t. 9 yrs., g.r. 19*l.* 10s. 100

By C. C. & T. MOORE.

Kingsland.—45 to 56, Red Lion-st., f. 3,800

St. George's East.—432, 458, and 460, Cable-st., u.t. 5½ yrs., g.r. 12*l.* 145

334, 336, and 338, Cable-st., u.t. 10 yrs., g.r. 7*l.* 10s., r. 89*l.* £440

403 and 405, Cable-st., u.t. 11½ yrs., gr. 4*l.* 285

305, Cable-st., u.t. 29 yrs., g.r. 15*l.*, e.r. 90*l.*, with goodwill and fixtures 510

46, 48, and 48A, Dean-st., f. 800

13, 14, and 15, Station-pl., f. 515

Stepney.—112 and 114, Charles-st., u.t. 23½ yrs., g.r. 6*l.* 6s. 430

14A, 15A, and 16, Thomas-st., u.t. 11½ yrs., g.r. 8*l.* 370

Stratford.—49 to 59 (odd), Rosher-rd., u.t. 52½ yrs., g.r. 18*l.* 930

Leytonstone.—31, Cann Hall-rd., u.t. 77½ yrs., g.r. 7*l.* 10s., e.r. 45*l.* 430

Old Ford.—12, Dane-pl., f. 325

Peckham.—36 and 38, Camden-grove-north, u.t. 62¾ yrs., g.r. 8*l.* 600

Ponder's End.—1, Commerce-ter., u.t. 77 yrs., g.r. 4*l.* 10s., r. 30*l.* 325

By NEWBON, EDWARDS, & SHEPHARD.

Islington.—41, St. Paul-st., u.t. 26 yrs., g.r. 3*l.* 7s. 3d., r. 40*l.* 335

Tottenham.—73 to 83 (odd), Seaford-rd., u.t. 71 yrs., g.r. 25*l.* 16s. 970

9 and 12, Havergal-villas, u.t. 72 yrs., g.r. 15*l.*, r. 80*l.* 870

Crouch Hill.—26, Blythwood-rd., u.t. 74½ yrs., g.r. 10*l.* 10s., r. 50*l.* 490

Islington.—36, Theberton-st., u.t. 13 yrs., g.r. 7*l.*, r. 45*l.* 205

Canonbury.—45, Canonbury-rd., u.t. 17½ yrs., g.r. 7*l.*, r. 42*l.* 215

Stoke Newington.—34, Mayville-st., u.t. 58½ yrs., g.r. 5*l.*, r. 28*l.* 335

Hampstead-rd.—41, Mornington-cres., f., e.r. 48*l.* 775

Clapton.—46, Filey-av., u.t. 90 yrs., g.r. 9*l.*, e.r. 63*l.* 730

Highgate.—Archway-rd., Hartwell, u.t. 74½ yrs., g.r. 8*l.*, r. 52*l.* 540

Willesden.—Goodson-rd., f.g.r.'s 40*l.*, reversion in 94 yrs. 880

Bromley, Kent.—Havelock-rd., f.g.r. 49*l.* 10s., reversion in 79 yrs. 1,090

Walthamstow.—Hawksley-rd., five plots of land, f. 185

Muswell Hill.—Sydney-rd., a plot of building land, f. 150

By STIMSON & SONS.

Tottenham.—435 to 461 (odd), High-rd., f. 6,080

Edmonton.—1 to 8, Chapel-yard, f. 940

Chapel-yard, f.g.r. 10*l.* 10s., reversion in 18 yrs., renewable for ever without premium 370

24, Fore-st., area ¾ a., f., r. 30*l.* 1,120

26 to 36 (even) and 40, Fore-st., f. 2,850

8, Claremont-st. and field adjoining, 2 a. 2 r. 23 p., f., r. 25*l.* 1,300

10 to 16 (even), Claremont-st., f. 580

Claremont-st., f.g.r. 3*l.* 10s., reversion in 16 yrs., renewable for ever without premium 100

18 to 34 (even), Claremont-st., f. 870

Streatham.—High-rd., f.g.r.'s 65*l.*, reversion in 61 yrs. 2,730

Lewisham.—46, High-st., u.t. 28½ yrs., g.r. 75*l.*, r. 175*l.* 700

Old Kent-rd.—20, Manor-grove and 2, Hatcham-rd., u.t. 59 yrs., g.r. 8*l.* 8s. 250

Walworth.—30, 32, and 34, Phelp-st., u.t. 53 yrs., g.r. 9*l.* 15s. 180

By ROBERT NEWMAN (at Uxbridge).

Uxbridge, Middlesex.—21 and 22, Chapel-st., f. 385

Stanwell, Middlesex.—Burrowes Hill Closes, 14 a. 0 r. 18 p., f. 730

Harlington, Middlesex.—1, 2, and 3, The Cedars, c., r. 75*l.* 590

Townsend Orchard, 2 a. 3 r. 14 p., f. 580

Hillingdon, Middlesex.—Belle Vue House and 5 a. 0 r. 5 p., f. 2,070

By EDWIN EVANS (at Clapham Junction).

Battersea.—89 and 91, Surrey-lane, u.t. 93 yrs., g.r. 13*l.* 400

76 to 86 (even), Longhedge-st., u.t. 65 yrs., g.r. 30*l.* 1,200

15 to 25 (odd), Yelverton-rd., u.t. 96½ yrs., g.r. 36*l.* 1,380

35, Wayford-st., u.t. 75 yrs., g.r. 5*l.* 245

Fulham.—90, 92, and 94, Townmead-rd., u.t. 95 yrs., g.r. 10*l.* 690

Beddington Corner.—Lansdown Cottages (two), f. 450

March 29.—By FOSTER & CRANFIELD.

Hyde Park.—Westbourne-ter., i.g.r. 45*l.*, u.t. 36¼ yrs., g.r. 10*l.* 610

St. George's East.—34, Cable-st., f., r. 45*l.* 640

By FURBER, PRICE, & FURBER.

Stamford Hill.—35 to 45 (odd), 49 and 51, Paignton-rd., u.t. 69 yrs., g.r. 42*l.*, r. 244*l.* 1,760

Stoke Newington.—84, Cazenove-rd., u.t. 75¾ yrs., g.r. 13*l.*, r. 70*l.* 830

By ALFRED PREECE.

Edgware-rd. 15, 16, and 23, Burne-st., u.t. 25, 19¾ and 17½ yrs., g.r. 18*l.* 405

Wanstead.—33 to 45 (odd), Cowley-rd., u.t. 78 yrs., g.r. 22*l.* 615

Forest Gate.—63, 65, and 67, Wellington-rd., u.t. 99 yrs., g.r. 10*l.* 350

Poplar.—134, Canton-st., u.t. 99 yrs., g.r. 4*l.* 255

Bromley-by-Bow.—12, Bot-st., u.t. 99 yrs., g.r. 2*l.* 10s. 90

69 and 71, Fern-st., u.t. 99 yrs., g.r. 6*l.* 385

By PROTHEROE & MORRIS.

Snaresbrook.—Sylvan-rd., Springfield, f., e.r. 60*l.* 1,100

Leyton.—42, Manor-rd., f., e.r. 30*l.* 450

By A. J. SHEFFIELD.

Poplar.—2, 4, 6, and 8, Ettrick-st., u.t. 72 yrs., g.r. 15*l.* 910

342, 344, 346, 350, and 352, St. Leonard's-rd., u.t. 69 yrs., g.r. 20*l.* 905

Canning Town.—36 to 46 (even), Agate-st., u.t. 77 yrs., g.r. 19*l.* 10s. 800

Walthamstow.—1 and 3, Melville-rd., f. 560

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Isolation Hospital	Trowbridge Hospital Committee...	20*l.*, 10*l.*	June 24
*Fire Station	Manchester Corporation	300*l.*, 200*l.* and 100*l.*	do.
*Shops and Houses, Parkgate	Darlington Corporation	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Drain Pipes, &c.	Partick (N.B.) Town Council	Kincaid & Co., Engineers, 29, Great George-street, S.W.	April 9
Road Works, Withdean, Brighton		Jenkinson & White, 1, Prince's-street, S.W.	do.
Public Baths, Glodwick	Oldham Corporation	S. A. Pickering, Civil Engineer, Town Hall, Oldham	do.
Hotel, Bargoed, Wales		G. Kenshole, Architect, Duffryn, Maes-y-cwmmer	do.
Additions, &c., to Town Hall	Royston U.D.C.	H. F. J. Banham, Council Offices, Royston	do.
Granite Road Metal, Channelling, &c.	Canterbury Corporation	A. C. Turley, Civil Engineer, 45, High-street, Canterbury	April 10
Fireclay Retorts, Bricks, &c.	Rotherham Corporation	F. A. Winstanley, Engineer, Town Hall, Rotherham	do.
Drainage Works, Alkerton Hill	Banbury R.D.C.	H. Gander, Surveyor, Bath-road, Banbury	do.
Cherbourg Quartzite Road Metal	Tenterden Town Council	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden	do.
Cement, Lime, Kerbing, &c.	Hemel Hempstead Corporation	W. R. Locke, Engineer, Town Hall, Hemel Hempstead	do.
Police Buildings	Kirkcaldy Town Council	Williamson & Inglis, Architects, Kirkcaldy	do.
Bathing Houses, &c., Whitmore Bay, Glam.	Barry U.D.C.	J. C. Pardoe, Civil Engineer, Council Offices, Barry	do.
Twenty-five Houses, Ebbw Vale, Mon	Briery Hill Workmen's Bldg. Club	O. Newcombe, Architect, Laburnum House, Ebbw Vale	do.
Farm Buildings, &c., Winwick, near Warrington	Lancashire Asylums Board	J. P. Muspratt, County Offices, Preston	do
Drainage Works, &c., at Workhouse	Calstor (Lincs) Guardians	J. Hewins, Eleanor-street, Grimsby	April 11
Additions to Schools, Barden-road, Tonbridge, Kent		John Fagg, Quarry Bank, Tonbridge	do.
Electrical Plant	Hornsey U.D.C.	F. D. Askey, Council Offices, Southwood-lane, Highgate, N.	do.
Warehouse, Horton-street, Halifax		Jackson & Fox, Architects, 7, Rawson-street, Halifax	do.
*Road Making, &c., Works	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
Additions to Bare Schools, Morecambe		J. Hartley, Architect, Euston Chambers, Morecambe	April 12
Lavatories and Shelters, Meols-parade	Hoylake, &c., U.D.C.	T. Foster, Engineer, Council Offices, Hoylake	do.
Granite, Kerbs, Setts, &c.	Walsall R.D.C.	F. W. Mager, Engineer, Aldridge, Walsall	April 13
Engines, Dynamos, Travelling Crane, &c.	Kirkcaldy (N.B.) Corporation	W. L. Macindoe, Town Hall, Kirkcaldy	April 15
Additions, &c., to Sanatorium	Wigan Corporation	W. Bolton, Borough Engineer, Rodney-street, Wigan	do.
Kerbs, Setts, Macadam, &c.	Hoylake (Cheshire) U.D.C.	L. G. Dashper, Surveyor, Council Offices, Hoylake	do.
Sewerage Works, Ellesmere Port, near Chester	Wirral R.D.C.	Beloe & Priest, Civil Engineers, 13, Harrington-street, Liverpool	do.
Hospital Pavilions, &c.	Eastbourne Corporation	W. C. Field, Architect, Town Hall, Eastbourne	do.
Broken Granite (3,500 tons)	Plomesgate R.D.C.	T. Waller Read, Council Offices, Wickham Market	do.
Cast-iron Pipes (180 tons)	Birmingham Corporation	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Six Purifiers, &c.	Hindley Corporation	S. Holt, Gasworks, Hindley	do.
Pipes, &c.	Leeds Corporation	W. J. Jeeves, Town Hall, Leeds	do.
Borehole, Clophill	Ampthill (Beds) U.D.C.	G. & F. W. Hodson, Engineers, Loughborough	do.
Stoneware Pipe Sewers, High-street, &c.	Quarry Bank U.D.C.	W. Fiddian, Surveyor, Old Bank Offices, Stourbridge	April 16
Schools	Harrow United District School Bd	Houston & Houston, Architects, 5, York-buildings, Adelphi, W.C.	do.
*Laundry	Wilts County Lunatic Asylum	County Offices, Trowbridge	do.
*Paving	Deptford Borough Council	Municipal Offices, 20, Tanners-hill, Deptford	do.
Steel Superstructure, &c.	Chatham Town Council	A. T. Walmisley, Civil Engineer, 9, Victoria-street, S.W.	April 17
Outfall Sewers and Purification Works, Cranleigh	Hambledon R.D.C.	E. L. Lunn, Surveyor, 36, High-street, Guildford	do.
Service Reservoir, Upleadon	Gloucester Corporation	R. Read, Civil Engineer, Guildhall, Gloucester	April 18
*Repair of Floors	Metropolitan Asylums Board	Offices, Embankment, E.C.	do.
Four Houses, Sheils Institution, Carrickfergus		Young & Mackenzie, Architects, Scottish Provident-bldgs., Belfast	April 20
Pipe Sewers, &c., Acomb, Yorks	Great Ouseburn R.D.C.	Fairbank & Son, Civil Engineers, 13, Lendal, York	do.
School Buildings, &c.	Cressing (Essex) School Board	Clare & Ross, Architects, 66, Duke-street, Chelmsford	do.
Bridge over river Clyde, Glasgow	Caledonian Railway Company	J. Blackburn, 302, Buchanan-street, Glasgow	April 22
Pipe Sewers, &c.	Tanfield (Durham) U.D.C.	R. Heslop, Surveyor, Burnopfield, R.S.O.	April 23
*Post Office	Office of Works	Storey's Gate, S.W.	do.
Three Blocks Workmen's Dwellings	Sunderland Corporation	J. W. Moncur, Borough Surveyor, Town Hall, Sunderland	April 25
Additions to County Borough Asylum, Ryhope	do.	do.	April 30
Villa Residence at Asylum	do.	do.	do.
*Foundations	Office of Works	Storey's Gate, S.W.	do.
*Painting, &c.	Wanstead School Board	J. T. Bressey, 70, Bishopsgate-street Within, E.C.	May 6
*Sewers, &c.	Ilfracombe U.D.C.	Town Hall, Ilfracombe	May 14
Nurses' Home, &c., Wednesbury-road	Walsall & District Hospital Com...	Bailey & McConnal, Architects, Bridge-street, Walsall	No date
Church, Gorehill, Wath-upon-Dearne		E. I. Hubbard, Architect, Moorgate-street, Rotherham	do.
Granite Memorial Obelisk, The Downs, Clifton, Bristol		F. W. Marks, Architect, 3, Staples-inn, W.C.	do.
Excavation Works, Clayton-le-Moors	Mr. Jas. Broadley	Haywood & Harrison, Architects, Post Office-chmbrs., Accrington	do.
Causewaying, Kerbing, &c., Victoria Bridge	Haddington (N.B.) Town Council	G. H. Stevenson, Town Hall, Haddington	do
Business Premises, Dromore, Co. Down	Mr. J. Rowan	J. Russell, Civil Engineer, Architect, 22, Waring-street, Belfast	do.
House, Tarrington, near Hereford	Mrs. Sutherland	J. Taylor, Architect, Exchange-chambers, Hereford	do
Large Shed Buildings, near Consett, Durham		Engineer, Consett Iron Works, Co. Durham	do.
Club and Institute, Rowland's Gill, Durham		T. H. Stafford, sen., Architect, Lintz Green, Durham	do.
Drying Shed, &c., Military-road, Colchester		J. W. Start, Architect, Colchester	do.
Sixty-four Tenements	Wolverhampton Corporation	J. W. Bradley, Civil Engineer, Town Hall, Wolverhampton	do.
Hospital and Block of Buildings	Wrotham (Kent) U.D.C.	H. P. Monckton, Architect, 32, Walbrook, E.C.	do.
Church and School, Handsworth, Yorks		J. P. Earle, Architect, Norfolk-row, Sheffield	do.
Five Houses, Horsforth, near Leeds		Thos. Throup, Woodside, Horsforth	do.
Residence, How Mill, near Carlisle		T. Taylor-Scott, Architect, 43, Lowther-street, Carlisle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Principal Clerk and Assistant Solicitor	Holborn Borough Council	200*l.* per annum	April 11
*Assistant Surveyor and Building Inspector	Litherland U.D.C.	110*l.* per annum	April 15
*Chief Highway Surveyor	Nottingham Corporation	250*l.* per annum	April 16

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x. & xviii. *Public Appointments, pp.* xvii. & xviii.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 14 6	per 1,000	alongside,	in river.
Rough Stocks and Grizzles	1 11 0	,,	,,	,,
Facing Stocks	2 12 0	,,	,,	,,
Shippers	2 8 0	,,	,,	,,
Flettons	1 9 0	,,	at railway	depot.
Red Wire Cuts	1 15 6	,,	,,	,,
Best Fareham Red	3 11 0	,,	,,	,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,,	,,
Best Blue Pressed Staffordshire	4 7 0	,,	,,	
Do., Bullnose	4 12 0	,,	,,	,,
Best Stourbridge Fire Bricks	4 4 6	,,	,,	,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers	16 0 0	,,	,,	,,
One Side and two Ends	19 0 0	,,	,,	,,
Two Sides and one End	20 0 0	,,	,,	,,
Splays, Chamfered, Squints	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers	14 0 0	,,	,,	,,
One Side and two Ends	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
plays, Chamfered, Squints	14 0 0	,,	,,	,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best	

	s. d.		
Thames and Pit Sand	7 3	per yard,	delivered.
Thames Ballast	6 3	,,	,,
Best Portland Cement	38 0	per ton	,,
Best Ground Blue Lias Lime	25 6	,,	,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 13s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 32s. 6d. per ton at rly. dpt.

STONE.

	s. d.			
Ancaster in blocks	2 0	per ft. cube,	deld. rly.	depôt.
Bath ,,	1 7	,,	,,	
Farleigh Down Bath	1 8	,,	,,	
Beer in blocks	1 6½	,,	,,	
Grinshill ,,	1 10	,,	,,	
Brown Portland in blocks	2 2	,,	,,	
Darley Dale in blocks	2 1½	,,	,,	
Red Corsehill ,,	2 5	,,	,,	
Red Mansfield ,,	2 4½	,,	,,	
Hard York in blocks	2 10	,,	,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super.	at rly.	depôt
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,	
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,	
,, ,, 3 in. self-faced Ditto	0 9½	,,	,,	

SLATES.

in. in.	£ s. d.		
20 X 10 best blue Bangor	11 5 0	per 1000 of 1200	at ry. dep.
,, best seconds ,,	10 15 0	,,	,,
16 X 8 best ,,	6 2 6	,,	,,
20 X 10 best blue Portmadoc	10 13 0	,,	,,
16 X 8 best blue Portmadoc	6 0 0	,,	,,
20 X 10 best Eureka unfading green	11 2 6	,,	,,
16 X 8 ,, ,,	6 15 0	,,	,,
20 X 10 Permanent green	10 0 0	,,	,,
16 X 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.			
Best plain red roofing tiles	41 6	per 1,000	at rly.	depôt.
Hip and valley tiles	3 7	per doz.	,,	,,
Best Broseley tiles	48 6	per 1,000	,,	,,
Hip and valley tiles	4 0	per doz.	,,	,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,,	,,
Do. ornamental Do.	60 0	,,	,,	,,
Hip tiles	4 0	per doz.	,,	,,
Valley tiles	3 9	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,,	,,
Hip tiles	4 1	per doz.	,,	,,
Valley tiles	3 8	,,	,,	,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16 10 0	18 0 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	12 10 0	13 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,

PRICES CURRENT (*Continued*).

WOOD.

	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	4 0 0	4 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	27 10 0	28 10 0
3 in. by 9 in.	24 0 0	25 0 0
Battens, 2½ in. and 3 in. by 7 in.	20 0 0	21 0 0
Second yellow deals, 3 in. by 11 in.	22 10 0	24 0 0
,, ,, 3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	16 10 0	18 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
Do. 3 in. by 9 in.	22 0 0	23 0 0
Battens	16 10 0	17 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	14 0 0	14 10 0
Third yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	14 10 0
Battens	12 10 0	13 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 10 0	16 10 0
,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 10 0	13 10 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	11 0 0	12 0 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 2 8
Small ,, ,,	0 2 4	0 2 7
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 2 3	0 3 0

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 15 0	8 15 0
Compound Girders ,, ,,	9 10 0	10 15 0
Angles, Tees and Channels, ordinary sections	9 7 6	11 7 6
Flitch Plates	9 15 0	10 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 5 0	10 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	9 10 0	- - -
Staffordshire Crown Bars, good merchant quality	9 15 0	10 0 0
Staffordshire "Marked Bars"	11 10 0	- - -
Mild Steel Bars	9 10 0	10 10 0
Hoop Iron, basis price	10 5 0	10 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 15 0	- - -
,, ,, to 24 g.	11 15 0	- - -
,, ,, to 26 g.	13 5 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 15 0	- - -
,, ,, 26 g.	15 10 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	17 0 0	- - -
,, ,, 22 g. and 24 g.	17 10 0	- - -
,, ,, 26 g.	19 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 10 0	- - -
,, ,, 26 g.	14 0 0	1 10 0
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	- - -
,, ,, 22 g. and 24 g.	14 0 0	- - -
,, ,, 26 g.	15 0 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	11 10 0	- - -
LEAD—Sheet, English, 3 lbs. & up.	16 0 0	- - -
Pipe in coils	16 10 0	- - -
Soil Pipe	19 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	25 0 0	- - -
Silesian	24 10 0	
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 7½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 9½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, ,, fourths	3¼d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, ,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, ,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	3d. ,, ,,
⅝ ,, ,, ,,	3¼d. ,, ,,
¾ ,, ,, ,,	4d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 2
,, ,, ,, in barrels	,,	0 2 3
,, ,, ,, in drums	,,	0 2 5
Boiled ,, ,, in pipes	,,	0 2 4
,, ,, ,, in barrels	,,	0 2 5
,, ,, ,, in drums	,,	0 2 7
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	25 10 0
Red Lead, Dry	,,	25 0 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. B. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

CLEETHORPES (Lincs).—For the erection of school buildings, Bursar-street, for the School Board of Cleethorpes. Mr. F. W. Croft, architect, Victoria-street, Great Grimsby. Quantities by Mr. Hoffman Wood, Leeds:—

Bowman & Son	£11,885 10 0	Hewins & Goodhand	£10,375 0 0
W. Barton	10,640 10 0	Wade, Ltd.	10,177 12 6
A. Sime	10,600 0 0	H. Marrows, Grimsby*	10,130 8 0
Thompson & Sons	10,490 0 0		

CROYDON.—For the erection of shop and workrooms Hedgis-yard. Mr. F. West, architect, Croydon:—

Wagstaff & Sons	£2,098	S. Page	£1,795
Smith & Son	1,978	G. Knight	1,757

GLOUCESTER.—For the erection of buildings at refuse destructor works, for the Corporation. Mr. H. A Dancey, architect, 26, Clarence-street, Gloucester:—

A. & E. King	£4,960 0 0	W. Byard	£4,305 0 0
Gurney & Sons	4,731 19 1	T. J. Williams	4,096 0 0
William Jones	4,560 0 0	Bowers & Sons, Hereford*	4,027 0 0

ILFORD.—For a pair of villas for Mr. Wm. Johnson. Mr. S. Doddimeade Edmunds, architect, St. Albans and London.—

J. & H. Cocks	£1,698	Cordell & Sons, Clapton (modified)*	£930
Cordell & Sons	1,163		
F. J. Coxhead	1,050		

| *See also next page.*

HISTON.—For Baptist Schools, Histon, Cambridge. Messrs. Geo. Baines and Reginald Palmer Baines, architects, 5, Clement's-inn, Strand, W.C.:—

—	T.G. Cowell.	Oak Building Company.	Ernest West.	Coulson & Lofts.	William Wade.	Scales & Robins.	H. Feast.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Estimate "A"	2,489 0 0	2,254 0 0	2,220 0 0	2,119 0 0	1,998 0 0	1,895 0 0	1,803 0 0*
" "B"	138 0 0	103 0 0	97 0 0	99 0 0		85 0 0	‡
" "C"	46 0 0	36 0 0	38 0 0	37 16 6	27 16 0	33 0 0	36 0 0*
" "D"	24 0 0	20 0 0	14 16 0	14 9 0	23 16 0	16 0 0	13 0 0*
" "E"	20 0 0	16 0 0	6 0 0	6 0 0	15 12 6	9 0 0	—
						Total..	1,852 0 0

Architects' estimate, £1,900. ‡ Not tendered for.

LONDON.—For the erection of boundary wall, &c., at electricity works, Townmead-road, for the Fulham Borough Council. Mr. Charles Botterill, C.E., Town Hall, Walham Green, S.W.:—

F. G. Minter	£987	Sydney Knight	£895
Geo. Wade	902	Leather & Sons	819

NOTTINGHAM.—For the erection of motor-car works, Canal-street, for Mr. E. R. Bridson. Mr. W. Dymock Pratt, architect, Cauldon Chambers, Long-row, Nottingham. Quantities by architect:—

E. Hind	£1,840 0 0	A. G. Bell....	£1,663 0 0
Green & Sons	1,809 10 0	Jas. Wright ..	1,645 0 0
J. Lewin	1,802 0 0	T. Cuthbert ..	1,645 0 0
G. M. King ..	1,800 14 5	Williamson & Co.	1,584 0 0
W. Crane, Ltd.	1,733 0 0	J. G. Thomas, Netherfield*	1,547 0 0
W. Maule....	1,710 0 0		
F. Messom ..	1,670 0 0		

RUSHDEN.—For the erection of two houses and stables for Mr. Alex. Ladds, "Hayway, Rushden." Quantities by the architect, Mr. H. Knight:—

F. Henson	£828 0	H. Sparrow	£777 0
Whittington & Tomlin	805 0	Johnson & Phillips	760 0
T. Willmott	803 0	Hacksley Bros.	750 0
C. E. Bayes	793 10	W. Packwood.....	725 0
E. Mitchell	779 0	T. Swindall, Rushden*	719 0

ST. ALBANS.—For alterations and additions, Myrtle Cottage, London-road, for Mr. W. H. Moores. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

Whibley & Jervis..	£230 0	Goodchild & Sons,	
Hammond & Sons	165 11	St. Albans*	£149 15

SALTASH.—For alterations and additions to No. 2, Port View Villas, for Mr. J. Bennett. Mr. Edgar M. Leest, architect, Saltash and Devonport:—

S. E. D. Ough	£274 10	W. V. Alford	£260 0
W. H. Rothery....	264 0	Taylor & Mutton*	245 0

[All of Saltash.]

SHENLY BARNET (Herts).—For a pair of cottages for Mr. Thos. Perry. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

Boff Bros.	£618	Goodchild & Sons, St.	
Goodchild & Sons	550	Albans (modified)* ..	£500

WEST HAM.—For the erection of dynamo-house, Dagenham, for the Town Council:—

H. J. Carter....	£910 0 0	G. Wise.....	£707 12 1
R. Myall	893 0 0	Gregar & Son	695 0 0
A. Gray	850 0 0	Windsor & Sons	680 7 4
C. North	798 0 0	Foster Bros., Norwood Junction*	595 10 0
Thomas & Edge	759 7 9		
S. Salt	740 7 3		

WREXHAM.—For additions to Vron Schools, Brymbo, for the School Board. Messrs. Davies & Moss, architects, 2, Temple-row, Wrexham. Quantities by architects:—

W. E. Samuel	£2,100 0 0	R. Roberts....	£1,785 0 0
S. Moss.....	2,051 18 8	R. Williams ..	1,750 0 0
J. T. Jones ..	1,893 0 0	T. Williams, Southsea* ..	1,549 17 0
Haycherly&Co.	1,800 0 0		

CORRECTION.—In our issue of the 9th ult. the name of Messrs. Chessum & Sons appears in the list of tenders for police station at Sidcup, instead of Messrs. J. T. Messom & Sons.

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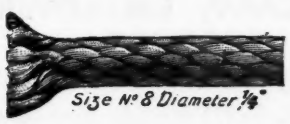

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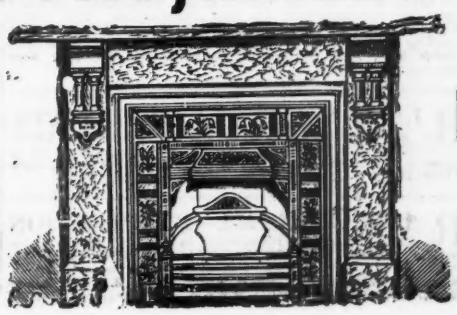

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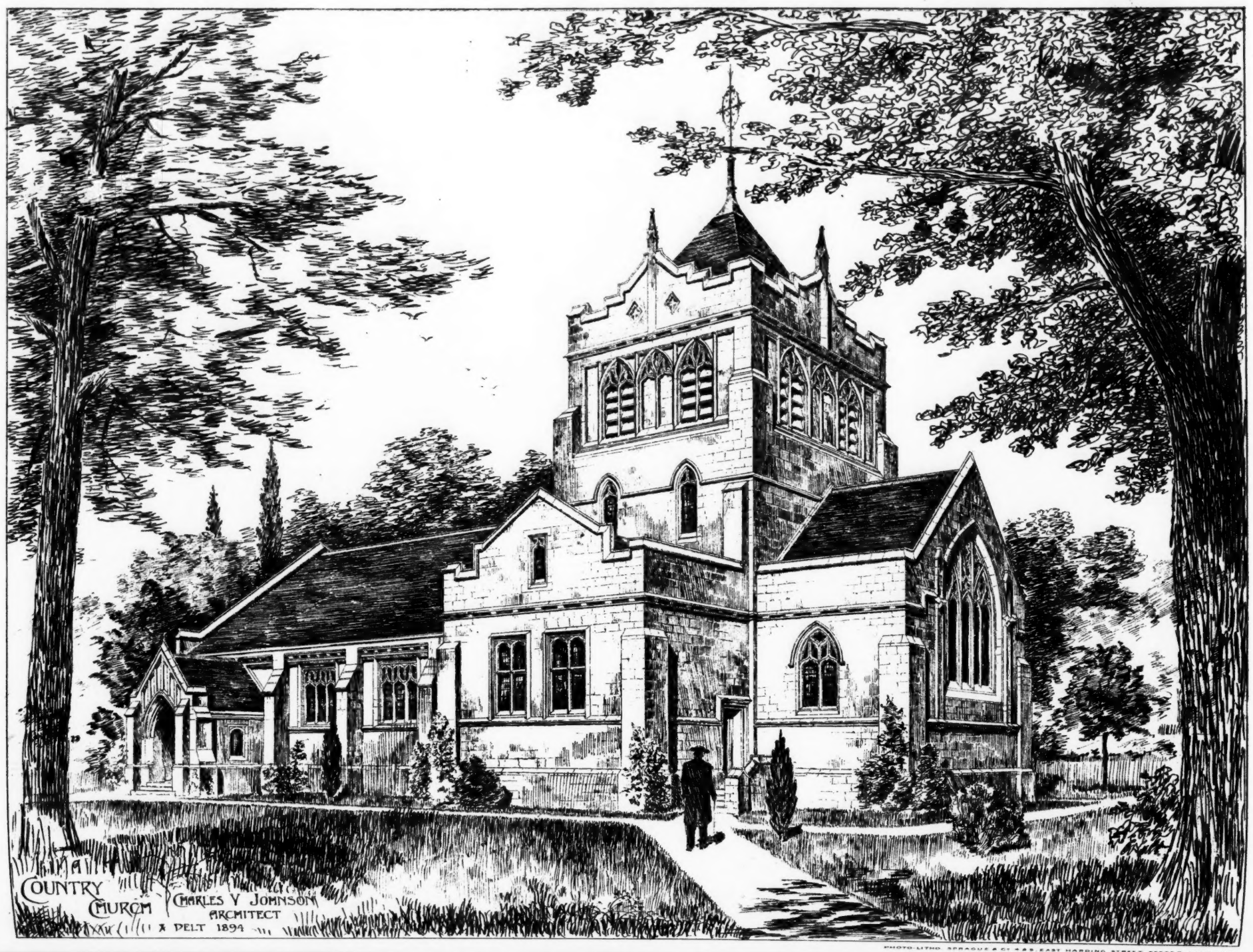
PARTNERSHIP offered to a competent young ARCHITECT or QUANTITY SURVEYOR. Established London practice with large works always in hand. Premium, 1,000*l.* An able man only required, who will be guaranteed minimum income.—Box 126, Office of "The Builder."

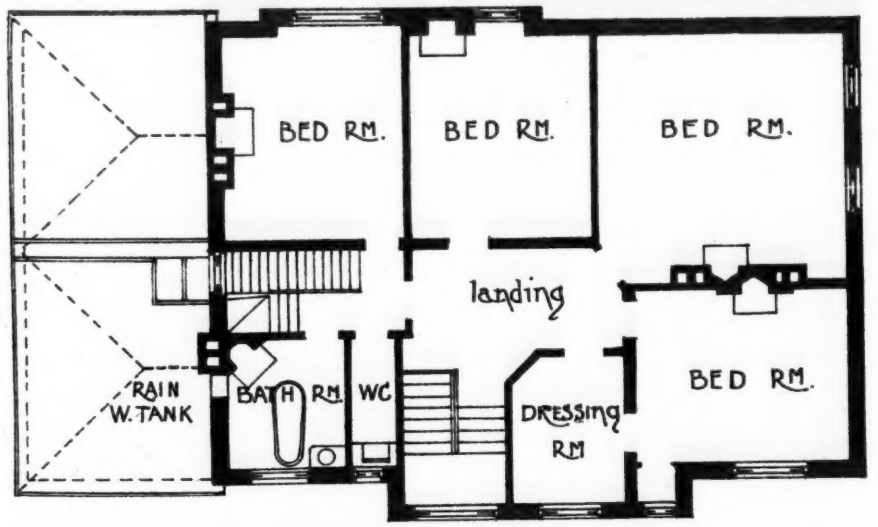


A COUNTRY CHURCH
CHARLES V JOHNSON
ARCHITECT
DELT 1894

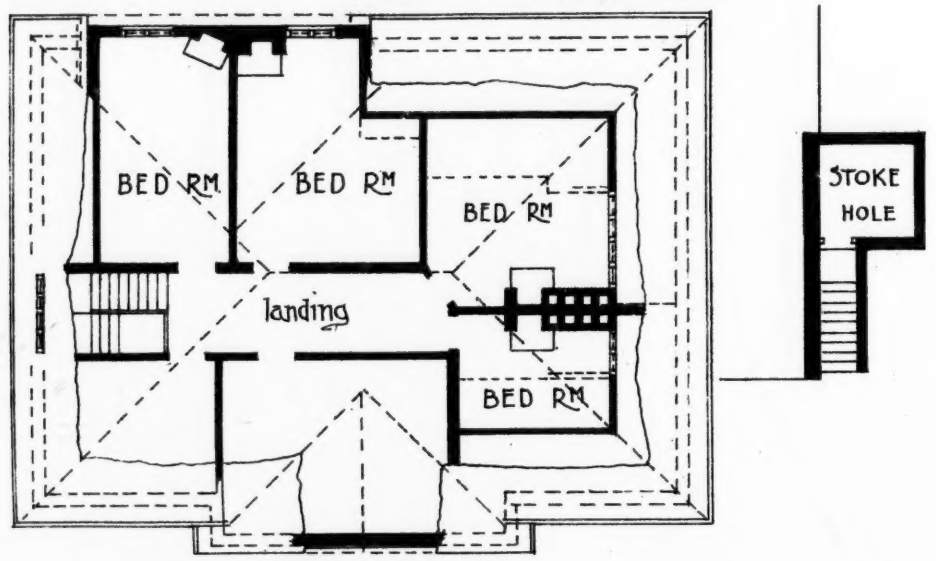
PHOTO-LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

PHOTOLITHO OFFSET BY THE GOLDEN CITY PRESS, 44 EAST HARDING STREET, FLEET ST., E.C.4

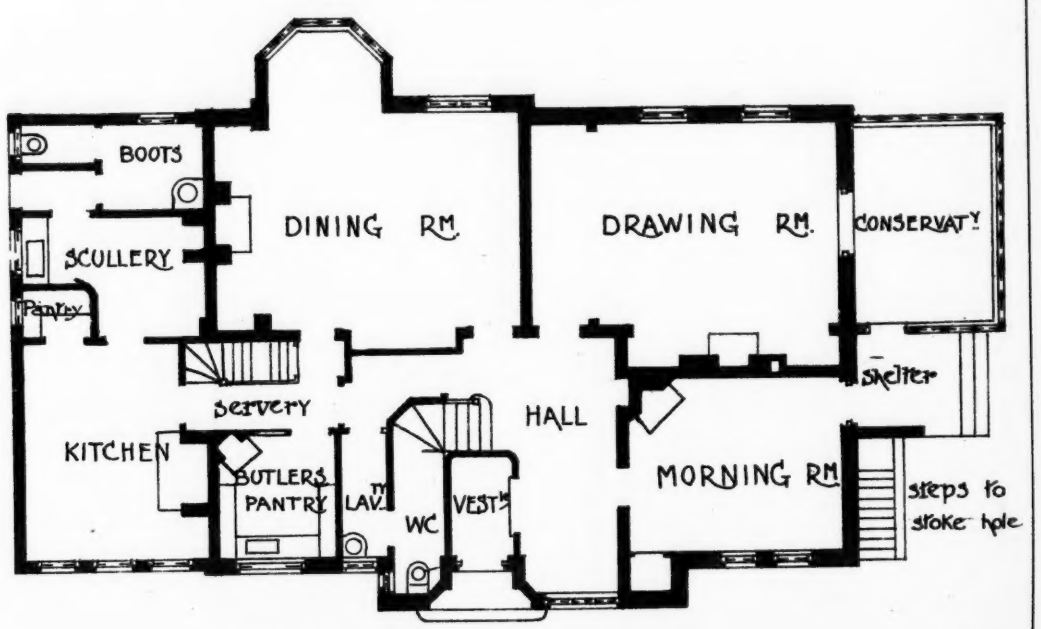
FRONT ELEVATION



FIRST FLOOR PLAN



ATTIC PLAN



GROUND FLOOR PLAN

SCALE 10 0 10 20 30 40 OF FEET

SCALE 10 5 0 10 20 30 40 FEET

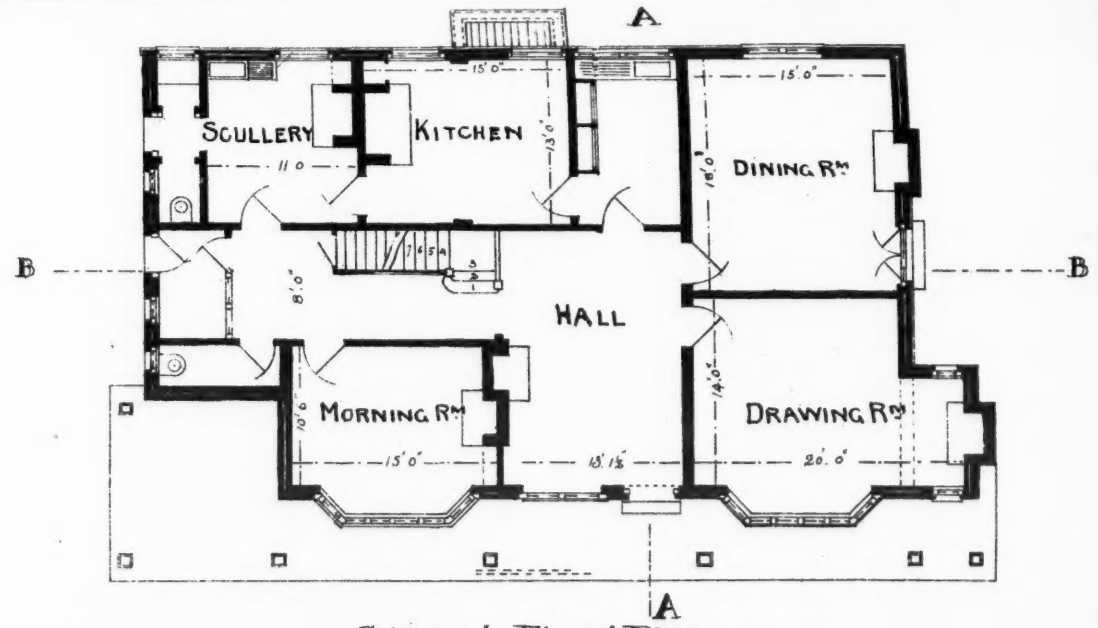
SMALL SUBURBAN HOUSES

Illustrations to Mr. Beattie Wood's Paper at the Architectural Association

PHOTO-LITHO. SPRAGUE & Co. LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

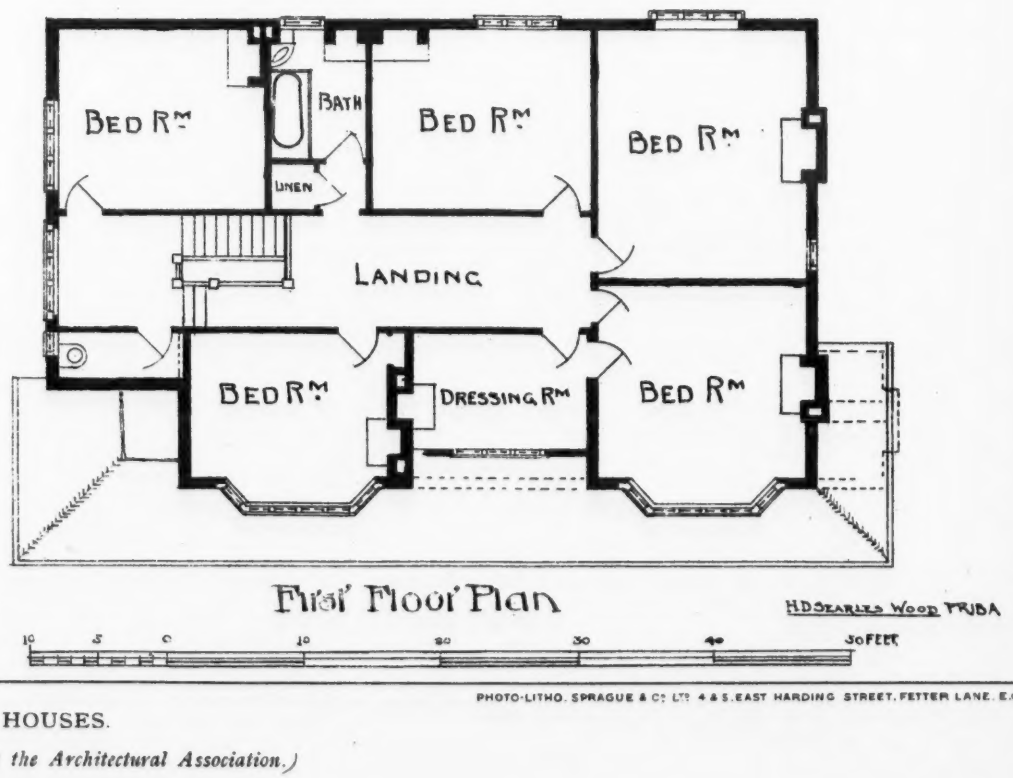
THE BUILDER, APRIL 6, 1901

NORTH ELEVATION



Ground Floor Plan

SOUTH ELEVATION



First Floor Plan

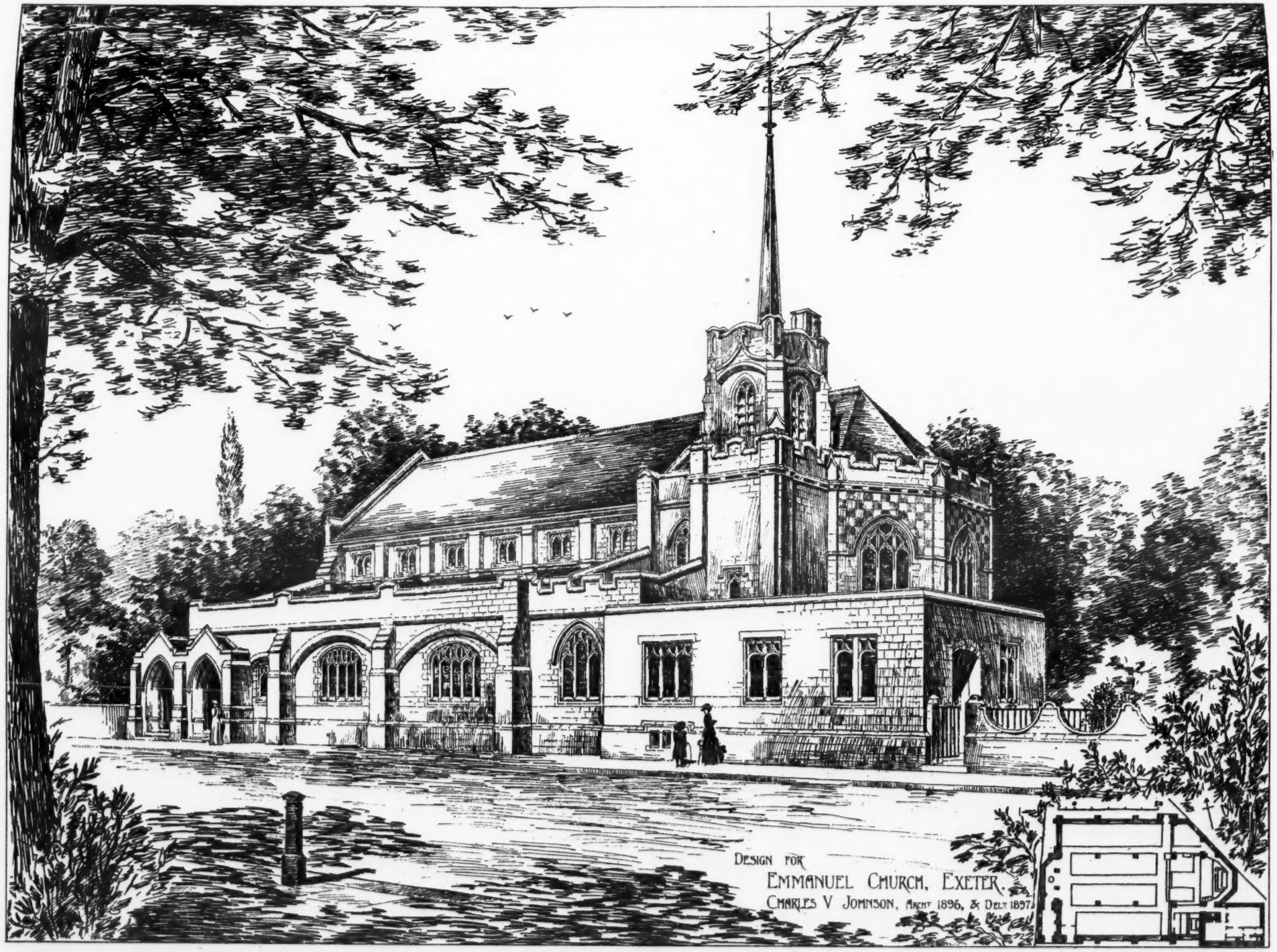
H.D. SEARLES WOOD FRIBA

10 5 0 10 20 30 40 50 FEET

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SMALL SUBURBAN HOUSES.

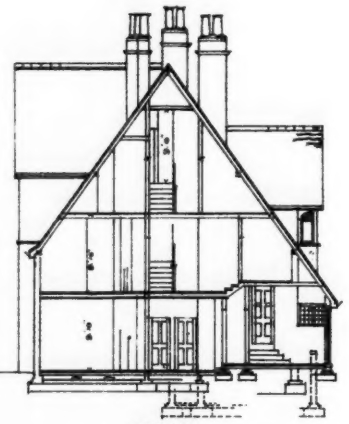
(Illustrations to Mr. Searles-Wood's Paper at the Architectural Association.)



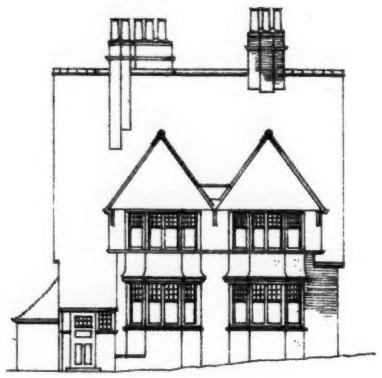
DESIGN FOR
EMMANUEL CHURCH, EXETER.
CHARLES V JOHNSON, ARCHT 1896, & DELT 1897.

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

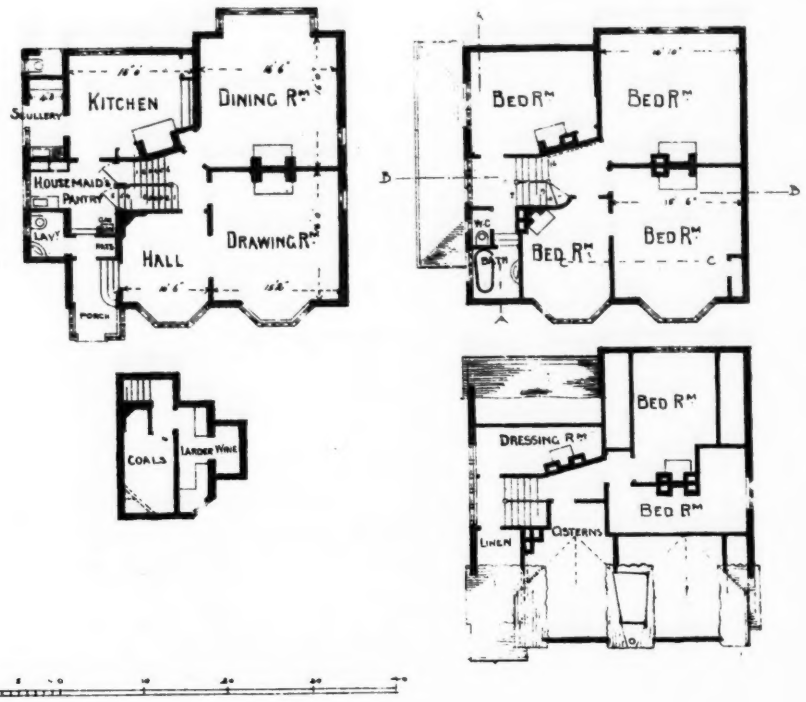
END ELEVATION.



SECTION



FRONT ELEVATION



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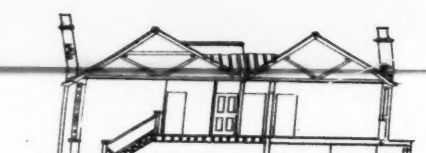
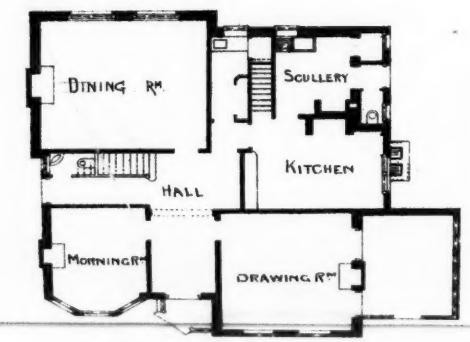
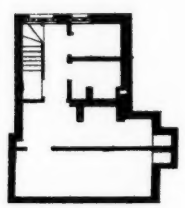
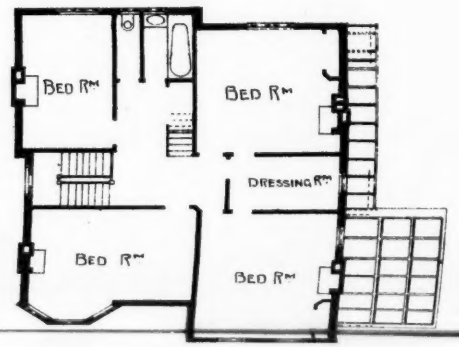


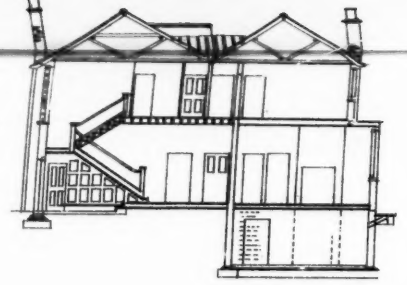


GROUND FLOOR PLAN

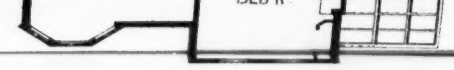




FIRST FLOOR PLAN

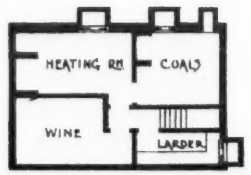


GROUND FLOOR PLAN



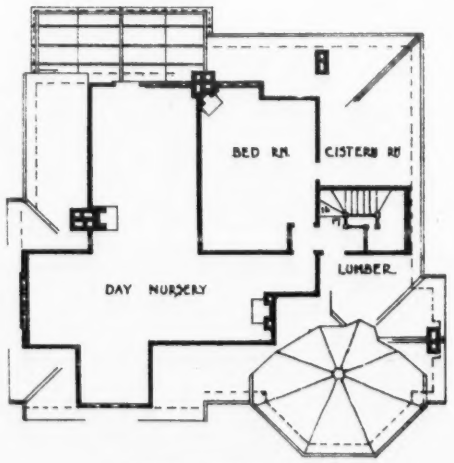
FIRST FLOOR PLAN

HODGKINS WOOD FRIDA
187 Wool Exchange
Coleman Street London E.C.



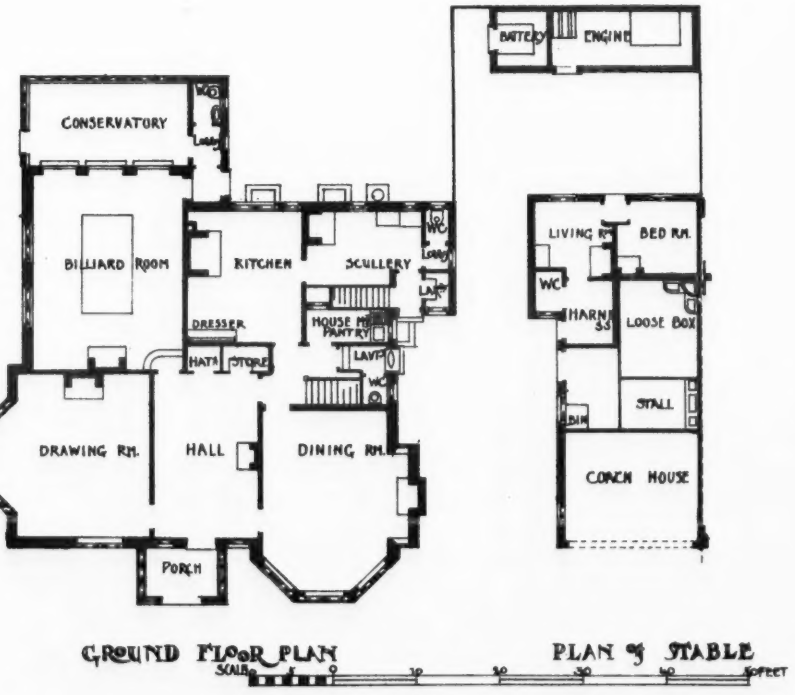
BASEMENT

FRONT ELEVATION



ATTIC PLAN

FIRST FLOOR PLAN



GROUND FLOOR PLAN

PLAN of STABLE

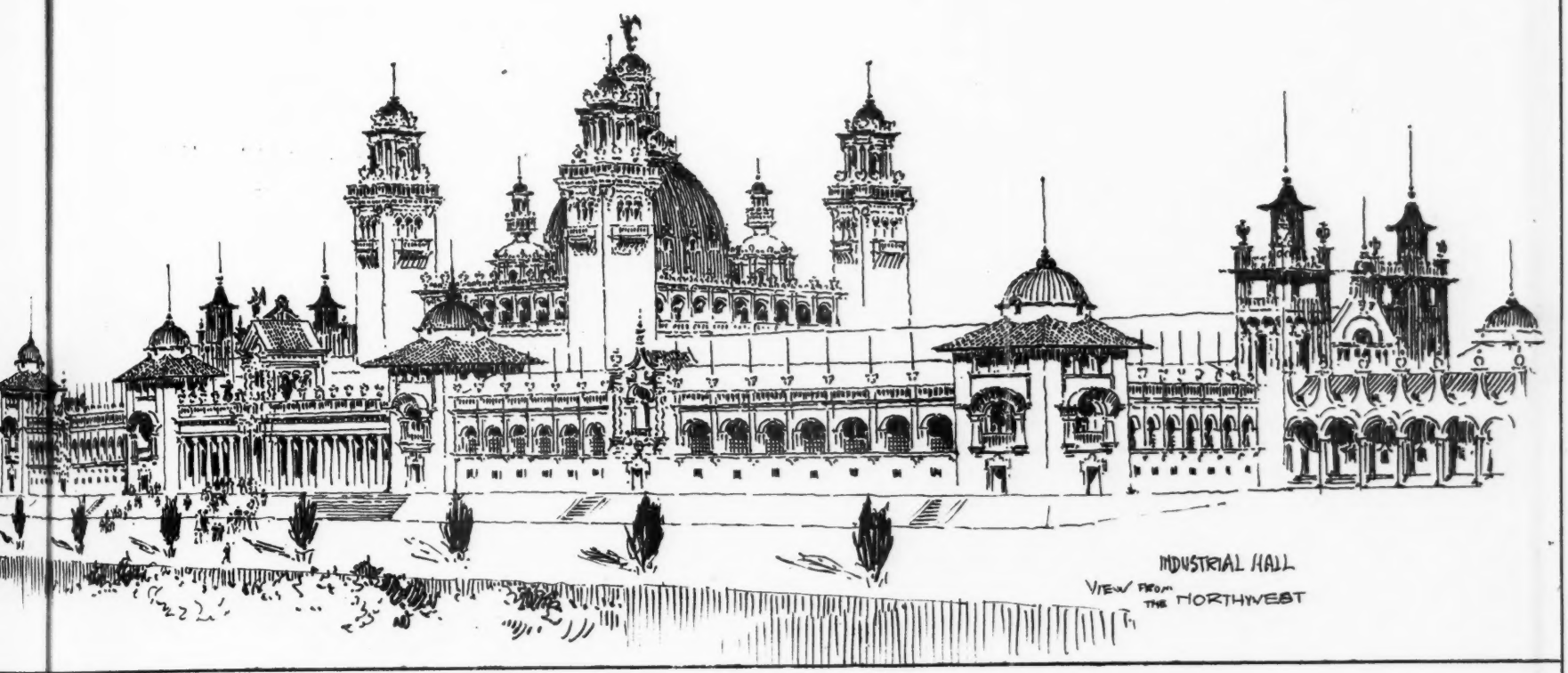
SCALE 10 5 0 10 20 30 40 50 60 FEET

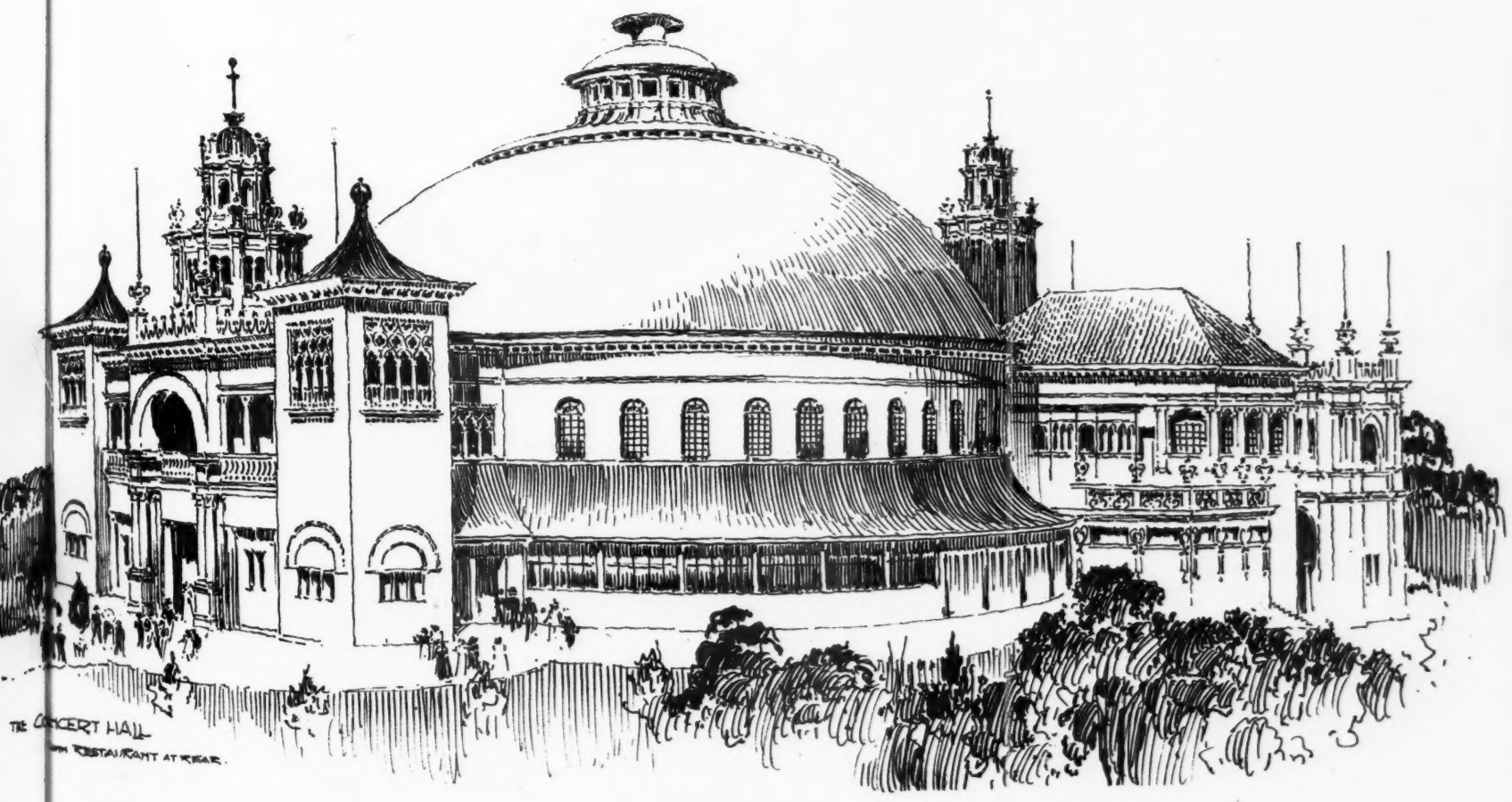
PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET. FETTER LANE. E.C.

SMALL SUBURBAN HOUSES.

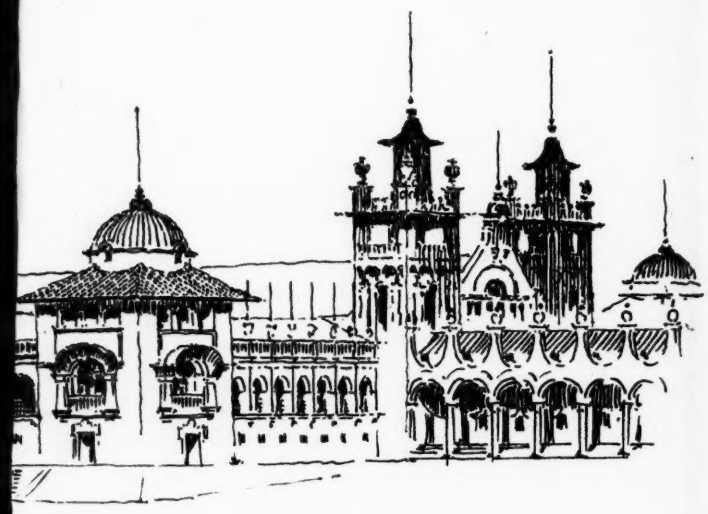
(Illustrations to Mr. Searles-Wood's Paper at the Architectural Association.)

PORCHES IN NORTH FRONTAGE
2 SIMILAR IN SOUTH do —

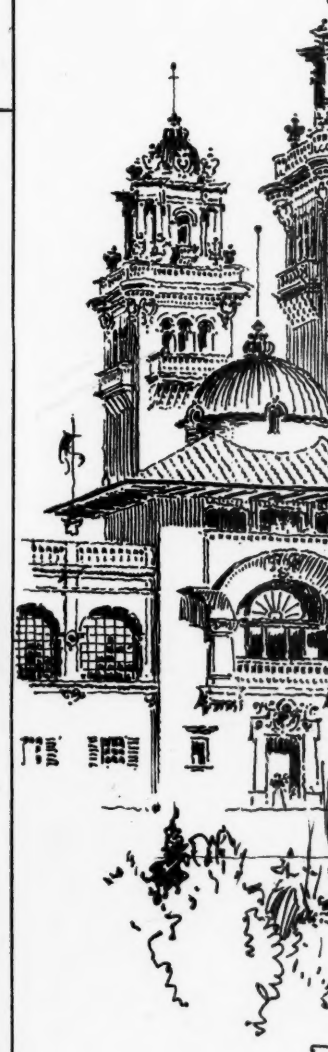




ILLUSTRATIONS OF THE GLASGOW EXHIBITION BUILDINGS.—From Sketches by Mr. A. McGibbon.



INDUSTRIAL HALL
VIEW FROM THE NORTHWEST



—From Sketches by Mr. A. McGibbon.

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